

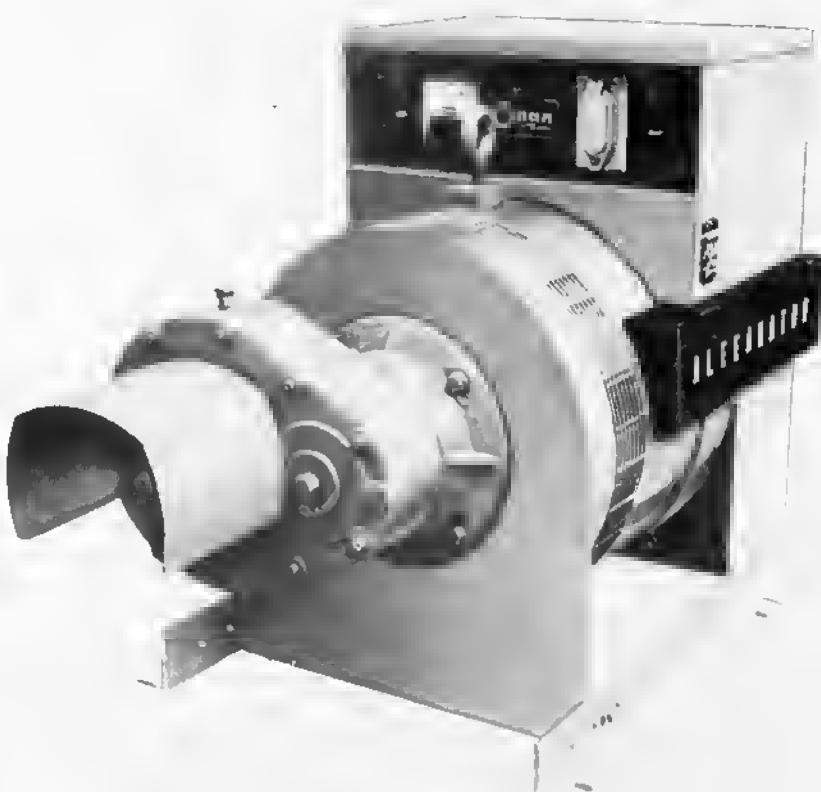
Onan Operator's Manual and Parts Catalog

Tractor PTO Powered

SERIES

UR

Alternator



FORM NUMBER
971-0007

ISSUE DATE

5-80 (SPEC A-G)

Replaces 12-79 (Spec A-E)

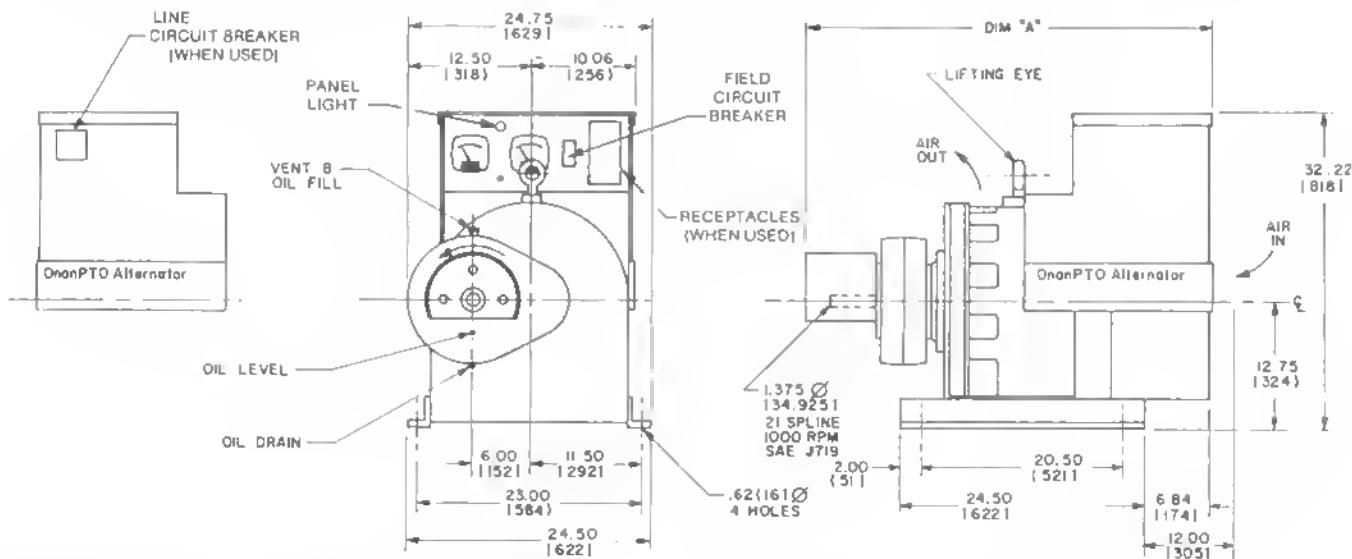
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The information in this supplement pertains to the IUR PTO alternator which is similar to the UR alternator. It contains model and rating information and a parts list for use in conjunction with the Operator's manual 971-0007.

Model Selection and Rating Table

Model	Standby Rating		Electrical Characteristics					Motor Starting Maximum kVA	PTO rpm
	kW	kVA and PF	Voltage	Amp	Hertz	Phase	Wire		
30.0IUR-535G	30.0	30.0 at 1.0 PF	110/220	136.4	50	1	3	75.0	1000
30.0IUR-53G	30.0	30.0 at 1.0 PF	120/240	125.0	50	1	3	75.0	1000
30.0IUR-57G	30.0	37.5 at 0.8 PF	220/380	57.0	50	3	4	100.0	1000
35.0IUR-535G	35.0	35.0 at 1.0 PF	110/220	159.1	50	1	3	88.0	1000
35.0IUR-53G	35.0	35.0 at 1.0 PF	120/240	145.8	50	1	3	88.0	1000
35.0IUR-57G	35.0	43.8 at 0.8 PF	220/380	66.5	50	3	4	109.0	1000
40.0IUR-535G	40.0	40.0 at 1.0 PF	110/220	181.8	50	1	3	100.0	1000
40.0IUR-53G	40.0	40.0 at 1.0 PF	120/240	166.7	50	1	3	100.0	1000
40.0IUR-57G	40.0	50.0 at 0.8 PF	220/380	76.0	50	3	4	145.0	1000
47.0IUR-535G	47.0	47.0 at 1.0 PF	110/220	213.6	50	1	3	118.0	1000
47.0IUR-53G	47.0	47.0 at 1.0 PF	120/240	195.8	50	1	3	118.0	1000
47.0IUR-57G	47.0	58.8 at 0.8 PF	220/380	89.3	50	3	4	150.0	1000
35.0IUR-3G	35.0	35.0 at 1.0 PF	120/240	145.8	60	1	3	88.0	1000
35.0IUR-4G	35.0	43.8 at 0.8 PF	120/208	121.4	60	3	4	120.0	1000
35.0IUR-33G	35.0	43.8 at 0.8 PF	139/240	105.2	60	3	4	140.0	1000
35.0IUR-7XG	35.0	43.8 at 0.8 PF	240/416	60.7	60	3	4	120.0	1000
35.0IUR-4XG	35.0	43.8 at 0.8 PF	277/480	52.6	60	3	4	140.0	1000
40.0IUR-3G	40.0	40.0 at 1.0 PF	120/240	106.7	60	1	3	100.0	1000
40.0IUR-4G	40.0	50.0 at 0.8 PF	120/208	138.8	60	3	4	140.0	1000
40.0IUR-33G	40.0	50.0 at 0.8 PF	139/240	120.3	60	3	4	159.0	1000
40.0IUR-7XG	40.0	50.0 at 0.8 PF	240/416	69.4	60	3	4	140.0	1000
40.0IUR-4XG	40.0	50.0 at 0.8 PF	277/480	60.1	60	3	4	159.0	1000
47.0IUR-3G	47.0	47.0 at 1.0 PF	120/240	195.8	60	1	3	118.0	1000
47.0IUR-4G	47.0	58.8 at 0.8 PF	120/208	163.1	60	3	4	167.0	1000
47.0IUR-33G	47.0	58.8 at 0.8 PF	139/240	141.3	60	3	4	187.0	1000
47.0IUR-7XG	47.0	58.8 at 0.8 PF	240/416	81.5	60	3	4	167.0	1000
47.0IUR-4XG	47.0	58.8 at 0.8 PF	277/480	70.7	60	3	4	187.0	1000

kW ratings are based on temperature rise as specified in BS 4999, Part 32 and IEC34-1



UNIT RATING	DIM "A"	WT lbs	MASS (kg)
30.0IUR,SONz,18.3Ø	39.12	1994.1	753
35.0IUR,SONz,18.3Ø	39.62	(1007)	783
35.0IUR,60Hz,18.3Ø	39.12	(994)	753
40.0IUR,50Hz,18.3Ø	40.25	(1022)	820
40.0IUR,60Hz,18.3Ø	39.62	(1007)	783
47.0IUR,50Hz,18.3Ø	41.88	(1064)	918
47.0IUR,50Hz,3Ø,60Hz,1Ø	41.00	(1041)	865
47.0IUR,60Hz,3Ø	40.25	(1022)	820

DIMENSIONS IN 11 ARE MILLIMETRES

<u>REF. NO.</u>	<u>PART NO.</u>	<u>QTY.</u>	<u>DESCRIPTION</u>
	GEAR DRIVE 80X (1000 RPM)		
	GEAR DRIVE BOX - COMPLETE (TERRELL)		

<u>REF. NO.</u>	<u>PART NO.</u>	<u>QTY.</u>	<u>DESCRIPTION</u>
	190-0578	1	60 Hertz
	190-0579	1	50 Hertz
1	190-0590	2	Housing (Half)
2	GEAR, PINION		
	190-0549	1	60 Hertz
	190-0571	1	50 Hertz
3	GEAR		
	190-0550	1	60 Hertz
	190-0570	1	50 Hertz
6	190-0589	2	Cover
7	190-0588	1	Cover
8	190-0587	1	Flange, Generator
14	190-0586	1	Gasket, Housing
15	190-0585	4	Shim, Fibre (.005")
16	SHIM		
	190-0582	AS REQ	.020"
	190-0583	AS REQ	.007"
	190-0584	AS REQ	.005"
17	190-0580	3	Spacer, Ring
26	870-0281	4	Nut, Self Lock (3/8-16)
27	STUD		
	190-0568	4	3/8 X 2"
	190-0581	4	5/16-18 X 2"

GENERATOR

<u>REF. NO.</u>	<u>PART NO.</u>	<u>QTY.</u>	<u>DESCR1PT1ON</u>
1	ROTOR ASSEMBLY - WOUNO (INCLUDES PARTS MARKED *)		
	201-2362	1	30kW, 3 Phase, 50 Hertz 35kW, 3 Phase, 60 Hertz 30kW, 1 Phase, 50 Hertz 35kW, 1 Phase, 60 Hertz
	201-2361	1	30kW, 3 Phase, 60 Hertz 30kW, 1 Phase, 60 Hertz
	201-2363	1	35kW, 3 Phase, 50 Hertz 40kW, 3 Phase, 60 Hertz 35kW, 1 Phase, 50 Hertz 40kW, 1 Phase, 60 Hertz
	201-2364	1	40kW, 3 Phase, 50 Hertz 47kW, 3 Phase, 60 Hertz 40kW, 1 Phase, 50 Hertz
	201-2366	1	47kW, 1 Phase, 50 Hertz
	201-2365	1	47kW, 3 Phase, 50 Hertz 47kW, 1 Phase, 60 Hertz

<u>REF. NO.</u>	<u>PART NO.</u>	<u>QTY.</u>	<u>DESCRIPTION</u>
7	STATOR ASSEM8LY, WOUNO		
	220-1863	1	30kW, 3 Phase, 60 Hertz
	220-1864	1	35kW, 3 Phase, 60 Hertz
	220-1865	1	40kW, 3 Phase, 60 Hertz
	220-1866	1	47kW, 3 Phase, 60 Hertz
	220-1875	1	30kW, 1 Phase, 60 Hertz
	220-1876	1	35kW, 1 Phase, 60 Hertz
	220-1877	1	40kW, 1 Phase, 60 Hertz
	220-1879	1	47kW, 1 Phase, 60 Hertz
	220-3196	1	30kW, 3 Phase, 50 Hertz
	220-3197	1	35kW, 3 Phase, 50 Hertz
	220-3198	1	40kW, 3 Phase, 50 Hertz
	220-3199	1	47kW, 3 Phase, 50 Hertz
	220-3246	1	30kW, 1 Phase, 50 Hertz
	220-3247	1	35kW, 1 Phase, 50 Hertz
	220-3248	1	40kW, 1 Phase, 50 Hertz
	220-3250	1	47kW, 1 Phase, 50 Hertz
12	STUO, ALTERNATOR THROUGH		
	520-0718	4	30kW, 3 Phase, 60 Hertz 30kW, 1 Phase, 60 Hertz
	520-0719	4	30kW, 3 Phase, 50 Hertz 35kW, 3 Phase, 60 Hertz 30kW, 1 Phase, 50 Hertz 35kW, 1 Phase, 60 Hertz
	520-0720	4	35kW, 3 Phase, 50 Hertz 40kW, 3 Phase, 60 Hertz 35kW, 1 Phase, 50 Hertz 40kW, 1 Phase, 60 Hertz
	520-0721	4	40kW, 3 Phase, 50 Hertz 47kW, 3 Phase, 60 Hertz 40kW, 1 Phase, 50 Hertz

	520-0722	4	47kW, 3 Phase, 50 Hertz 47kW, 1 Phase, 60 Hertz
	520-0723	4	47kW, 1 Phase, 50 Hertz
13	220-2353	1	Stator Exciter Assembly, Wound

CONTROL

<u>REF. NO.</u>	<u>PART NO.</u>	<u>QTY.</u>	<u>DESCRIPTION</u>
1	301-5611	1	Box, Control
2	301-5884	1	Cover, Control Box
3	301-5885	1	Plate, Control Box Cover
6	301-5689	1	Chassis, Control
12	302-0421	1	Voltmeter, 0-300 Volt
14	315-0431	1	Transformer, Voltage
19	332-1956	1	Board Assembly, Printed Circuit
21	305-0524	1	Rectifier, Bridge (SCR)
23	HARNESS, WIRING - CONTROL		
	338-1342	1	30kW, 57 Amps, 50 Hertz - 35kW, 66-5 Amps, 50 Hertz - 40kW, 76 Amps, 50 Hertz, 47kW, 89.3 Amps, 50 Hertz
	338-1343	1	30kW, 125 Amps, 50 Hertz - 35kW, 145 Amps, 50 & 60 Hertz - 35kW, 121.4 Amps, 60 Hertz - 40kW, 166.7 Amps, 50 & 60 Hertz - 40kW, 138.8 Amps, 60 Hertz - 47kW, 195.8 Amps, 50 & 60 Hertz - 47kW, 163.1 Amps, 60 Hertz
30	315-0343	1	Reactor, Commutator
31	821-0004	6	Screw, Locking Head (10-32 X 5/16")
32	322-0271	1	Light, Panel
33	322-0052	1	Bulb, Lamp
34	METER, FREQUENCY		
	302-0895	1	50 Hertz
	302-0811	1	60 Hertz
35	301-5691	1	Plate, Cover (4" X 6")
36	517-0132	1	Plug, Hole
37	301-5695	1	Plate, Cover - Circuit Breaker

PRINTED CIRCUIT BOARD ASSEMBLY
(332-1956) - FOR COMPONENTS,
SEE PAGE 23.

SAFETY PRECAUTIONS

Investigation of thousands of accidents shows that careless use of machinery causes nearly 1/3 of all accidents. Study the following safety precautions carefully and insist that they be followed by those working with you and for you.

Clothing worn by the operator should be fairly tight and belted. Loose jackets, shirts, or sleeves should not be permitted because of the danger of getting into moving parts.

Do not allow anyone to operate the alternator without proper instructions.

Be sure power shields and guards are in place and secured before starting work.

Before lubricating alternator always:

1. Disengage all power
2. Shut off engine, and then
3. Wait until rotor stops

It is a good practice to have a fire extinguisher nearby. Be sure that the extinguisher is properly maintained and be familiar with its proper use.

Be sure engine is in a well-ventilated area.

Keep arms, legs, feet and other body parts out from underneath alternator when it is raised by lifting eye.

Make certain only a qualified electrician does the electrical installation.

Do not lunge after falling tools.

Make certain that power cannot be accidentally restored.

Do not work on underground electrical equipment.

Do not examine live equipment when mentally or physically fatigued.

Do not touch electrical equipment while standing on metal floors, damp concrete or other well grounded surfaces.

Do not handle electrical equipment while wearing damp clothing (particularly wet shoes) or while skin surfaces are damp.

Do not wear jewelry while working on electrical equipment.

Be extra cautious when working with alternator during a rain.

Do not take risks.

Do not work alone.

Read the operator's manual.

WARNING Onan uses this symbol throughout this manual to warn of possible serious personal injury.

CAUTION This symbol refers to possible equipment damage.

WARNING

ENGINE EXHAUST GAS (CARBON MONOXIDE) IS DEADLY!

Carbon monoxide is an odorless, colorless gas formed by incomplete combustion of hydrocarbon fuels. Carbon monoxide is a dangerous gas that can cause unconsciousness and is potentially lethal. Some of the symptoms or signs of carbon monoxide inhalation are:

- Dizziness
- Intense Headache
- Weakness and Sleepiness
- Vomiting
- Muscular Twitching
- Throbbing in Temples

If you experience any of the above symptoms, get out into fresh air immediately.

The best protection against carbon monoxide inhalation is a regular inspection of the complete exhaust system. If you notice a change in the sound or appearance of exhaust system, shut the unit down immediately and have it inspected and repaired at once by a competent mechanic.

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GENERAL INFORMATION

INTRODUCTION

This manual contains information for the proper installation, operation and maintenance of your alternator. We suggest you keep this book handy so it can be referred to when necessary.

If you wish to contact your dealer regarding this equipment, be sure to supply the complete model number and the full serial number. This information is necessary to identify your equipment among the many units manufactured.

DESCRIPTION

Onan UR models 45.0 kW, 65.0 kW and 80.0 kW are revolving field, two bearing, brushless alternators. AC output voltage is generated in the stator and controlled by an exciter-regulator system. The exciter-regulator produces DC for field excitation and regulates the AC output.

The rotor consists of four interconnected coils spaced symmetrically on a steel shaft which transmits excitation voltage to the field coils. The shaft is supported at both ends by ball bearings. A centrifugal blower on the drive end of the alternator draws air through the alternator for cooling.

The complete alternator includes an exciter-regulator system, mounting feet, lifting eye, mounted gear box with splined shaft, and control box.

Exciter-Regulator System

The exciter and voltage regulator work together to control the AC output voltage over a wide range of load conditions. This system is factory-set to provide the proper voltage.

Control Box

The control box includes a voltmeter, a fused, 120-volt, duplex receptacle, an exciter circuit breaker (alternator protection), and convenient load connection terminals.

Gear Box

The gear box is secured to the alternator's adapter and has two gears. A pinion gear is pressed onto the splined alternator rotor shaft. It meshes with a larger helical gear which is pressed onto the splined input shaft.

CAUTION

This alternator cannot be belt driven or damage will occur to the gear drive box.

OPTIONAL ACCESSORIES

Tumbling Rod

The 1000 rpm tumbling rod has a 21-spline yoke assembly at both ends and extends from 40 to 56-5/8 inches (1015 to 1435 mm).

The tumbling rod for the 540 rpm models has a six-spline yoke assembly at both ends. Its length extends from 41 to 57-5/8 inches (1040 to 1460 mm).

WARNING

TO AVOID POSSIBLE PERSONAL INJURY OR EQUIPMENT DAMAGE, A QUALIFIED ELECTRICIAN OR AN AUTHORIZED SERVICE REPRESENTATIVE MUST PERFORM INSTALLATION AND ALL SERVICE.

SPECIFICATIONS

	45.0 UR-3G	45.0 UR-5DG	65.0 UR-3G	65.0 UR-5DG
Watts	45,000	45,000	65,000	65,000
Starting Watts	120,000	165,000	163,000	208,000
Volts	120/240	120/240Δ*	120/240	120/240Δ*
Phase	1	3	1	3
Hertz (cycles per second)	60	60	60	60
Running current (amperes)	188	135	270	195
Power factor	1.0	0.8	1.0	0.8
Alternator speed (rpm)	1800	1800	1800	1800
Tractor PTO speed (rpm)				
21-Spline PTO Shaft**	1000	1000	1000	1000
6-Spline PTO Shaft	540	540	540	540
Gearbox oil capacity				
Spec C	2½ pts (1.18 lit)	2½ pts (1.18 lit)	2½ pts (1.18 lit)	2½ pts (1.18 lit)
Spec E	1½ pts (0.66 lit)	1½ pts (0.66 lit)	1½ pts (0.66 lit)	1½ pts (0.66 lit)
Spec G	2 pts (0.95 lit)	2 pts (0.95 lit)	2 pts (0.95 lit)	2 pts (0.95 lit)
Recommended gear lubricant ..	SAE 90 EP	SAE 90 EP	SAE 90 EP	SAE 90 EP
Minimum tractor hp required ...	82 (61 kW)	82 (61 kW)	118 (88 kW)	118 (88 kW)

* - Reconnectible to also deliver 120/208 volts, three phase.

** - 1000 rpm only begin Spec C.

80.0 UR-5DG	
Watts	80,000
Starting Watts	300,000
Volts	120/240Δ*
Phase	3
Hertz (cycles per second)	60
Running current (amperes)	241
Power factor	0.8
Alternator speed (rpm)	1800
Tractor PTO speed (rpm)	
21-Spline PTO Shaft**	1000
Gearbox oil capacity - Spec C	2½ pts (1.18 lit)
Gearbox oil capacity - Spec G	2 pts (0.95 lit)
Recommended gear lubricant	SAE 90 EP
Minimum tractor hp required	145 (108 kW)

* - Reconnectible to also deliver 120/208 volts, three phase.

** - 1000 rpm only begin Spec C.

SPECIFICATIONS

	40.0 UR-3G 40.0 UR-3S	40.0 UR-5DG 40.0 UR-5DS	55.0 UR-3G 55.0 UR-3S	55.0 UR-5DG 55.0 UR-5DS
Watts	40,000	40,000	55,000	55,000
Starting Watts	120,000	103,000	163,000	140,000
Volts	120/240	120/240△*	120/240	120/240△*
Phase	1	3	1	3
Hertz (cycles per second)	60	60	60	60
Running current (amperes)	166	120	229	166
Power factor	1.0	0.8		1.0
Alternator speed (rpm)	1800	1800	1800	1800
Tractor PTO speed (rpm)				
21-Spline PTO Shaft**	1000	1000	1000	1000
6-Spline PTO Shatt	540	540	540	540
Gearbox oil capacity				
Spec C	2½ pts (1.18 lit)	2½ pts (1.18 lit)	2½ pts (1.18 lit)	2½ pts (1.18 lit)
Spec A (1000 rpm PTO).....	5½ pts (2.6 lit)	5½ pts (2.6 lit)	5½ pts (2.6 lit)	5½ pts (2.6 lit)
Spec A (540 rpm PTO).....	2½ pts (1.18 lit)	2½ pts (1.18 lit)	2½ pts (1.18 lit)	2½ pts (1.18 lit)
Recommended gear lubricant ...	SAE 90 EP	SAE 90 EP	SAE 90 EP	SAE 90 EP
Minimum tractor hp required	73 (55 kW)	73 (55 kW)	100 (75 kW)	100 (75 kW)

* - Reconnect to also deliver 120/208 volts, three phase.

** - 1000 rpm only begin Spec C.

INSTALLATION

LOCATION

Figure 1 shows dimensions of the alternator and bolt-hole centers for installation. Select a site for the alternator with the following points in mind.

Ventilation

The alternator creates considerable heat when operating under load. It is important that this heat be dissipated by proper ventilation. If the alternator is installed inside a small room or compartment, provide a vent for exhausting the air heated by the alternator. Locate the exhaust vent above the inlet vent. Heated air is discharged from the drive-shaft end of the alternator.

CAUTION Failure to ensure adequate ventilation results in alternator overheating and possible damage to alternator components.

Convenience to Driving Power

Locate the alternator for easy connection to the tractor. Align the power take-off to the alternator. Stay within the limits of the power take-off shaft.

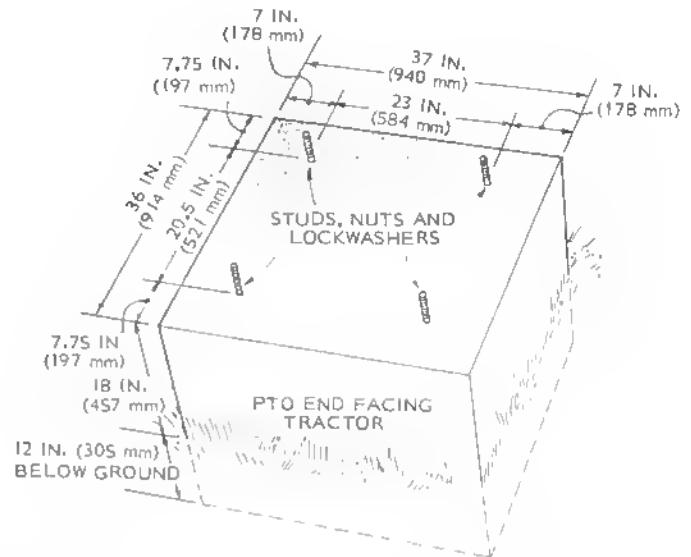


FIGURE 2. RECOMMENDED MOUNTING BASE

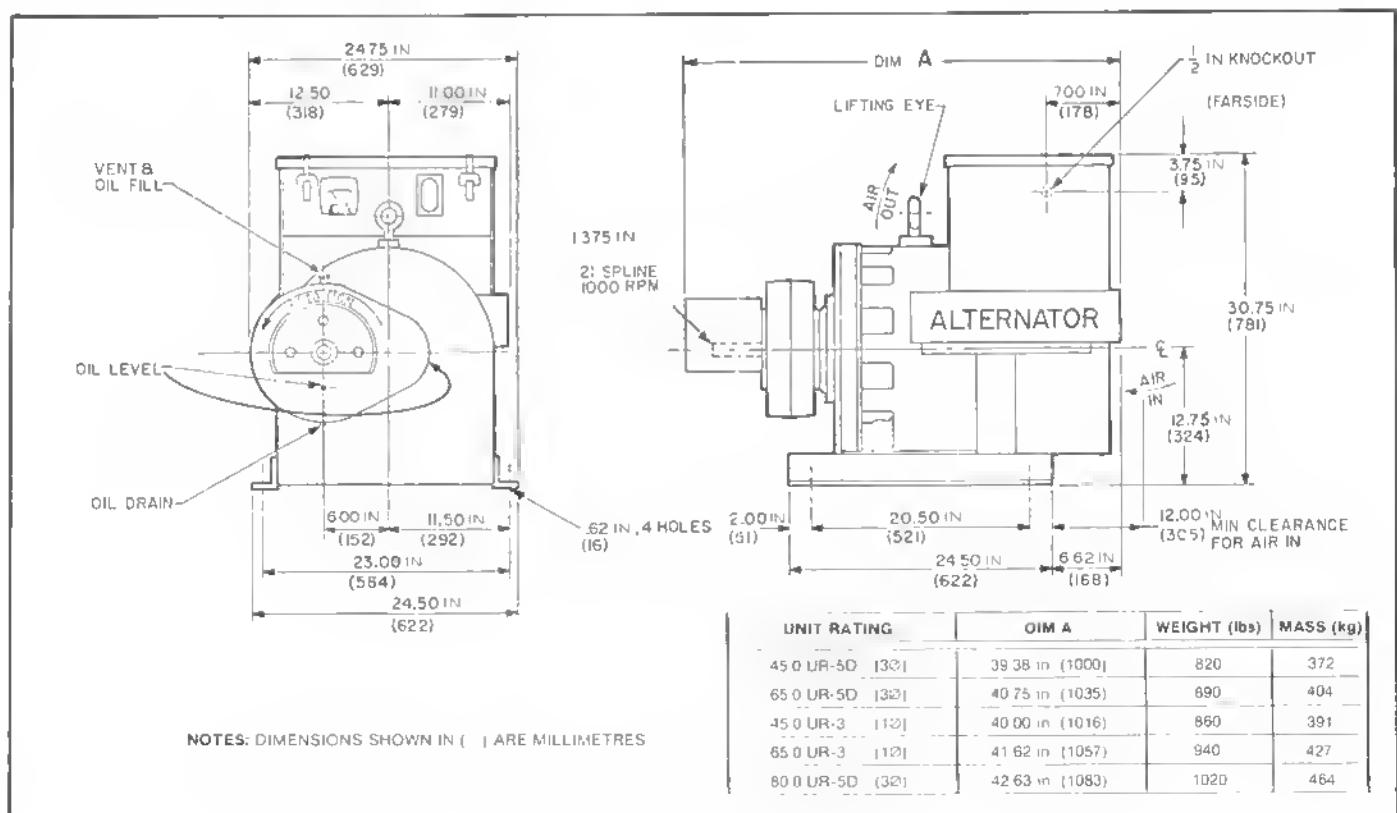


FIGURE 1. ALTERNATOR OUTLINE

Dusty or Damp Conditions

Avoid dusty or damp conditions as much as possible. Alternator should be mounted under cover or inside a building to protect it against the weather.

Servicing Convenience

Allow at least 24 inches (610 mm) of space on all sides of the alternator.

Wiring Convenience

Install the alternator as close as possible to the load

transfer switch. Do not move the load transfer switch to the alternator (see *Installing Load Transfer Switch*). Do not locate the alternator in a location difficult to service or a location which provides poor ventilation just to save a few feet of wire.

MOUNTING

Figure 2 shows the recommended mounting base and bolt hole centers to use for the alternator. Be sure the mounting base is level and flat so the alternator mounting brackets do not bend when tightened down. Be sure the alternator is properly aligned with

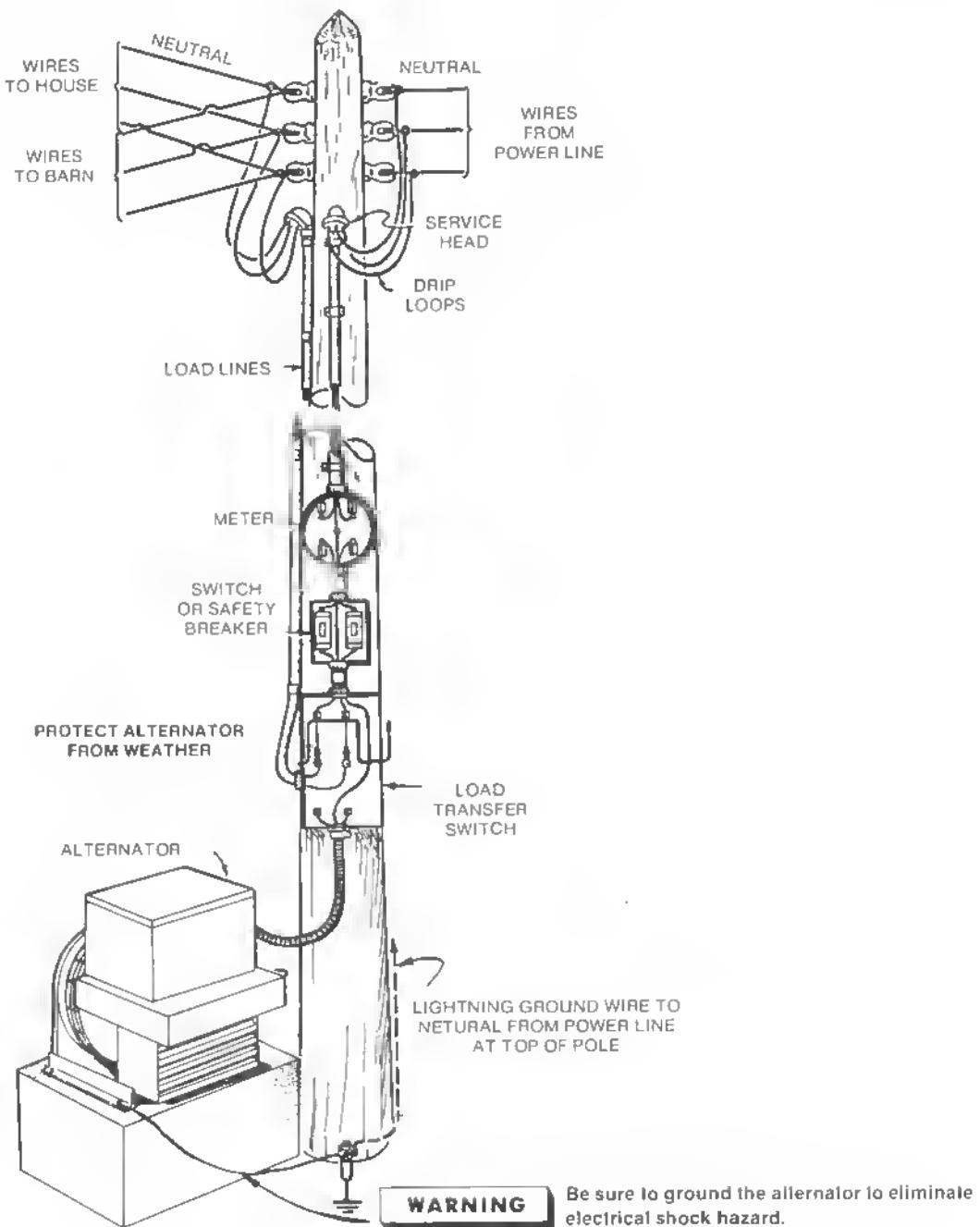


FIGURE 3. TYPICAL SINGLE-PHASE ALTERNATOR INSTALLATION

the driving mechanism and that it will stay in alignment. After securing the alternator with lockwashers and nuts, the alternator PTO shaft should turn freely.

CAUTION

Do not mount this alternator on a trailer. Torque from the tractor PTO will flip the alternator over unless secured to a strong substructure.

WIRING

Figure 3 shows a typical, single-phase installation of an alternator and a load transfer switch where the neutral is not switched. To gain access to the load connection bars of the alternator, open the two latches on the front of the control box. Then lift the cover off. Figure 4 shows the single-phase, three-wire connections; Figure 5 shows the three-phase, four-wire connections. Fasten the load wires to the connection bars with the capscrews and nuts. Knockouts are provided on each side of the control box.

WARNING

For a safe installation, personnel connecting the alternator and any auxiliary equipment must be fully qualified and understand wiring diagrams, etc.

120/240-Volt, 1-Phase, 3-Wire Alternator

Terminal L0 is the grounded (neutral) terminal. For 120-volt current, connect the "hot" load wire to either the L1 or L2 terminal (Figure 4). Connect the neutral load wire to the L0 terminal. Two 120-volt circuits are thus available, with not more than 1/2 the alternator rated capacity available on each circuit. Balance the load as closely as possible. If using both 120- and 240-volt current at the same time, use care not to overload either circuit.

120/240-Volt Delta, 3-Phase, 4-Wire Alternator

The 3-phase alternator is designed to supply 120-volt

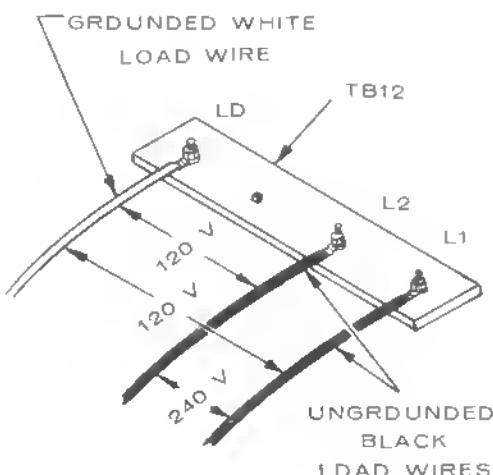


FIGURE 4. 120/240-VOLT, SINGLE-PHASE CONNECTIONS

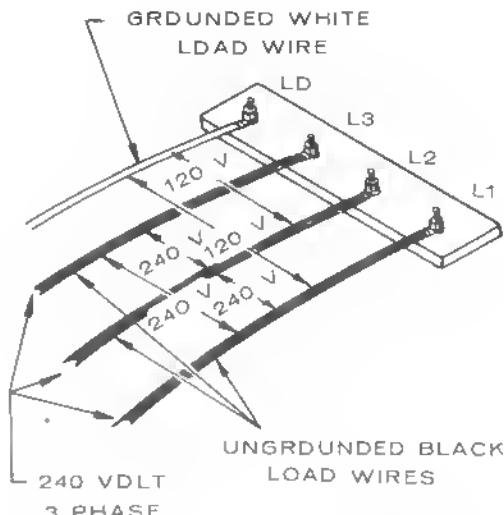


FIGURE 5. 120/240-VOLT, THREE-PHASE CONNECTIONS

and 240-volt, 1-phase current and 240-volt, 3-phase current.

For 3-phase operation, connect the three black load wires to the three terminals L1, L2, and L3—one wire to each terminal. For 3-phase operation, the L0 terminal is not used.

For 120/240-volt, 1-phase, 3-wire operation, terminals L1 and L2 are the "hot" terminals. The L0 terminal is the neutral, which can be grounded if required. For 120-volt service, connect the "hot" (black) load wire to either the L1 or L2 terminal. Two 120-volt circuits are available. A 240-volt, single-phase service can be obtained between any two three-phase terminals.

Any combination of 1-phase and 3-phase loading can be used at the same time as long as no terminal current exceeds the nameplate rating of the alternator. If no 3-phase output is used, usable 1-phase output is 2/3 of 3-phase kVA.

For reconnection to 120/208-voltage, refer to the wiring diagram.

Grounding the Alternator

WARNING

Be sure to ground the alternator to eliminate electrical shock hazard.

Connect a #8 or larger wire between the alternator and:

1. the lightning ground rod at the pole (grounds neutral from power line at top of pole) as shown in Figure 3, or
2. a separate ground pipe or rod penetrating into moist earth as detailed by local codes.

Installing the Load Transfer Switch

Before using an alternator for standby power service, install a double-throw load transfer switch following

local electrical codes. The switch must have an ampere rating large enough to carry the total load when the main power source is used.

Install the load transfer switch close to the main line switch, and between the main line switch and the load. The load wires must connect to the center terminals of the switch (Figure 3). The alternator leads and main power leads must connect at opposite ends of the switch.

When properly installed, the load transfer switch in one position will connect the electrical load to the main power source. When the switch is thrown to the other position, the load is first disconnected from the main power source, then connected to the alternator. Using the load transfer switch ensures the alternator will not be connected to the main power source.

Power Return Signal

When using the alternator for emergency applications, install a pilot light or alarm signal to indicate when the power is restored and the alternator can be disconnected. Connect a signal light across the regular power line, just ahead of the load transfer switch as shown in Figure 6. Install an on-off switch and a fuse for the signal light. When a power failure occurs, place power return switch to the "ON" position before putting the alternator into operation. When the normal power returns, the power return light will operate indicating that the alternator can be disconnected.

COMBINATION SINGLE AND THREE PHASE LOAD TRANSFER CONNECTIONS

Two load transfer switches and additional wiring are required to connect one standby 3-phase alternator in locations where separate 1-phase and 3-phase power lines normally supply the power. A 3-pole, double throw switch alternately connects the 240 volt, 3-phase line transformer power or the 240 volt, 3-phase alternator motor loads. A 2-pole, double throwswitch alternately connects the 120/240 volt, 1-phase line transformer power or the 1-phase alternator power to the 120 volt and 240 volt loads. The alternator and load transfer switches should be located close to the power line transformer which carries the heavier load. Separate power lines must be installed to carry power from the alternator to the lighter loads.

The alternator and load transfer switches should be located close to the power line transformer which carries the heavier load. Separate power lines must be installed to carry power from the alternator to the lighter loads. However, care must be exercised to ensure that the generator is not connected to multiple grounds in this type of application. For example, if the ground wire for the three-phase system was at L2 and the ground wire of the single-phase system was at L0 (see Figure 5), this multiple-ground condition would damage the generator windings.

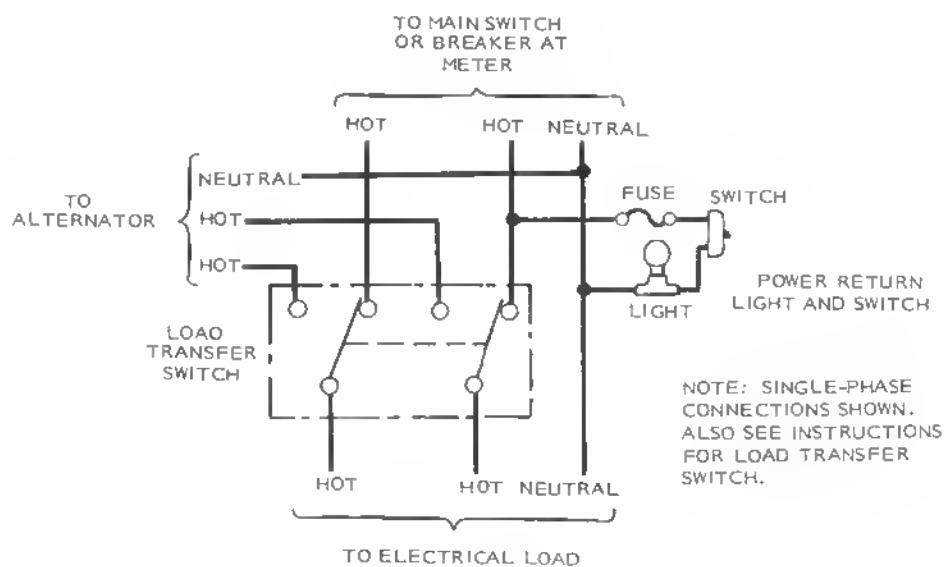


FIGURE 6. LOAD TRANSFER SWITCH CONNECTIONS

OPERATION

GENERAL

Figure 7 shows some items on the alternator which will aid you in understanding operation and maintenance procedures. Note the location of the air inlet and outlet. Keep these areas unobstructed to ensure sufficient alternator cooling. Listed are some common power requirements of appliances and other equipment. For large motors, see the nameplate for power requirements.

CONNECTING TRACTOR TO ALTERNATOR

When a power outage occurs, use the following procedure before engaging the tractor PTO.

1. Unlatch the control box cover and move the exciter circuit breaker to "OFF."
2. Back the tractor up so the PTO shaft will be straight and level as possible when connected (Figure 8).
3. Depress the spring-loaded pin on the PTO yoke and slide the yoke on to the alternator shaft. Make sure the pin is locked in the groove of the splined alternator shaft.
4. Connect the other end of PTO shaft and yoke to the tractor PTO splined shaft.
5. Turn on the power return signal switch (if one was installed).

POWER REQUIREMENTS

Item	Approx. Wattage
Refrigerator	600-1000
Dishwasher	1000-1800
Water Heater	1500-5000
Space Heater.....	1000-1500
Television	200-600
Electric Drill.....	250-750
Water Pump	450-1000
Range Top (per element)	800-1500
Range Oven	3000-4000
Food Freezer	300-800
Brooders	500-1000
Stock Tank Heater.....	300-1400

MOTORS*

Horsepower	Start	Run
1/2.....	2800	550
3/4.....	4300	775
1	5500	1000
2	7130	1960
3	10350	2970
5	16660	3500
7-1/2.....	23000	5250

* Capacitor type Repulsion-induction motors require less starting wattage. split-phase motors require slightly more starting wattage.

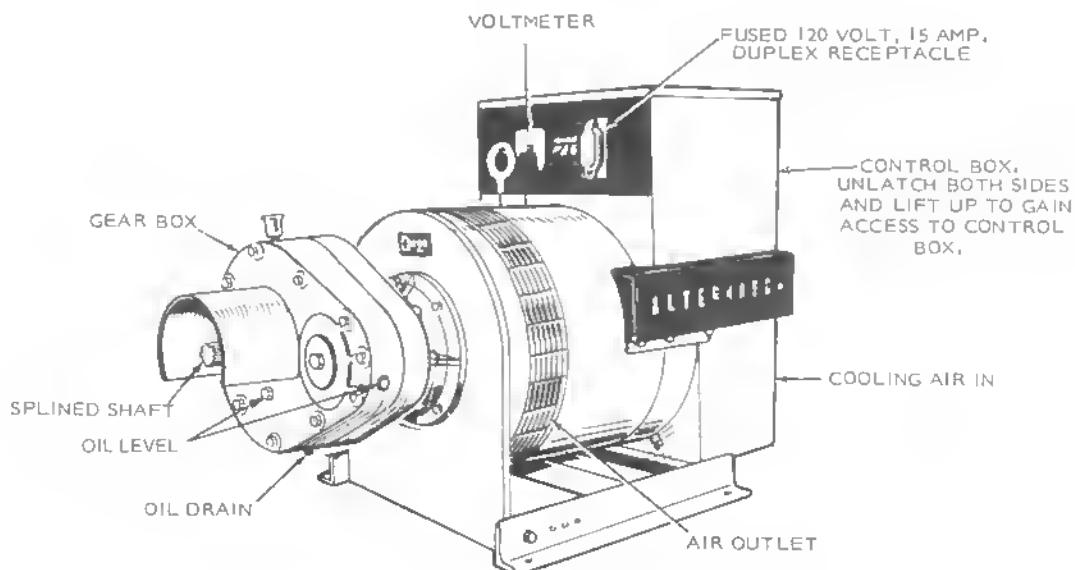


FIGURE 7. UR TRACTOR-DRIVE ALTERNATOR

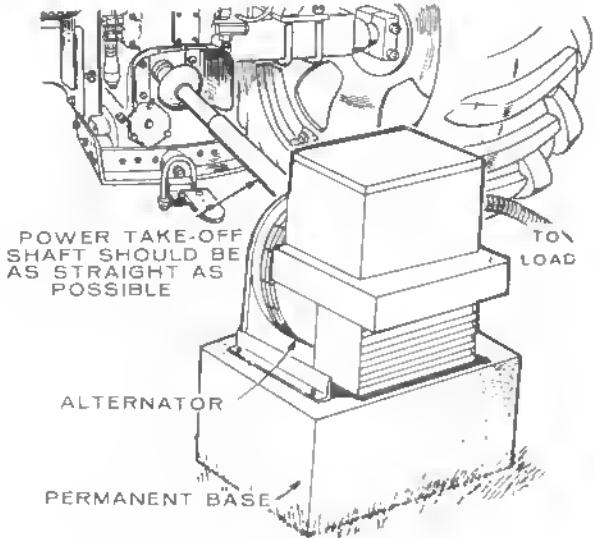


FIGURE 8. TRACTOR CONNECTION

STARTING ALTERNATOR AND CONNECTING LOAD

- With the tractor running, engage the power take-off and bring the PTO speed to 540 or 1000 rpm, whichever applies.

WARNING Make sure the PTO shaft shields are in place before engaging the PTO to prevent hazard of serious personal injury.

- Move the exciter circuit breaker in the control box to "ON."

- Check the voltmeter to make sure it reads approximately the correct line-to-line voltage.
- Close the control box cover and secure with latches.
- Connect the load to the alternator with the load transfer switch.

CAUTION

When large motor loads are added, connect one at a time if possible. Motors require four to five times more power starting than running at normal speeds. If several large motors are started at the same time, overload can develop during starting.

- Check the voltage and tractor PTO rpm. In some cases, you will have to change speed when large changes in load are made.

OPERATION WITH LOAD

If the tractor engine has very little reserve power, use care when operating the alternator. For example, if a 100-horsepower (at the power take-off) engine is used to drive a 55,000-watt alternator, the engine throttle will be wide open at full alternator load. If most of the electrical load is suddenly removed, the governor cannot act quickly and smoothly enough to prevent a surge of speed and high voltage. Any electrical equipment left connected may be damaged by the resulting high voltage.

When disconnecting large portions of the load, disconnect one piece of equipment at a time. Then remove the rest of the load. Wait until the alternator speed has stabilized and then reconnect that part of the load which will be left on. The alternator speed will remain relatively stable, and the tractor engine speed will not change or surge enough to cause any damage if this procedure is followed.

SERVICE AND MAINTENANCE

PERIODIC SERVICE AND INSPECTION

Follow a regular schedule of inspection and servicing. Make a good visual check before, during, and after alternator operation; look for loose or broken leads and bad connections.

GEAR BOX LUBRICATION

Drain the gear box after the first 50 hours of operation and refill with fresh lubricant of the recommended grade. Use only SAE 90 EP gear lubricant. Repeat this procedure every year thereafter, or every 300 hours, whichever occurs first.

Maintain the proper oil level between changes. Overfilling will cause foaming, which can lead to an oil leak due to overheating. Remove the filler plug on top of the case and the oil level plug. Reference Figure 9. Fill the case until the oil just begins to flow from the oil level plug hole (see the SPECIFICATIONS section for oil capacities). Replace both plugs. See Figure 9.

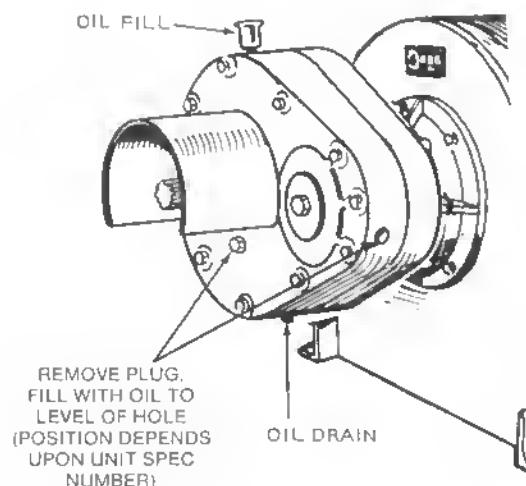


FIGURE 9. GEAR BOX LUBRICATION

POWER TAKE-OFF SHAFT

Grease the universal joints at least every 25 operating hours. Under adverse conditions, grease the joints as required, possibly every 4 to 8 hours. Never operate the alternator with the shield removed from the power take-off shaft.

WARNING

Be extremely careful when working near a running unit. Avoid wearing loose clothing which could get caught in the revolving PTO.

ALTERNATOR BEARING

The alternator rear bearing is double-sealed and pre-lubricated. Inspect the bearing every 1000 hours to ensure that the outer race is not rotating while the alternator is running.

Replace the bearing every five years. Deterioration of the bearing grease, due to oxidation, makes this replacement necessary.

EXCITER VOLTAGE REGULATOR

This system contains no moving parts. Occasionally blow out dust, etc. with clean, filtered air. Check thoroughly to assure that all components are mechanically secure and that all electrical connections are tight. Refer to Figure 10 for view of the control box interior.

FUSE REPLACEMENT

A fused, 120-volt duplex receptacle provides for convenient load connections up to 15 amperes. If exceeding this load, the fuse will blow and will require replacement. To change fuse, unlatch top panel of control box and lift open. Twist fuseholder as shown in Figure 10 and replace with Buss ABC 15 or equivalent.

OUTPUT VOLTAGE

A voltage adjusting potentiometer located on the printed circuit board inside the control box provides for a $\pm 3\%$ adjustment of the output voltage. This potentiometer is preset at the factory and should not require readjustment unless replacing printed circuit board (contact your dealer or nearest Onan service center).

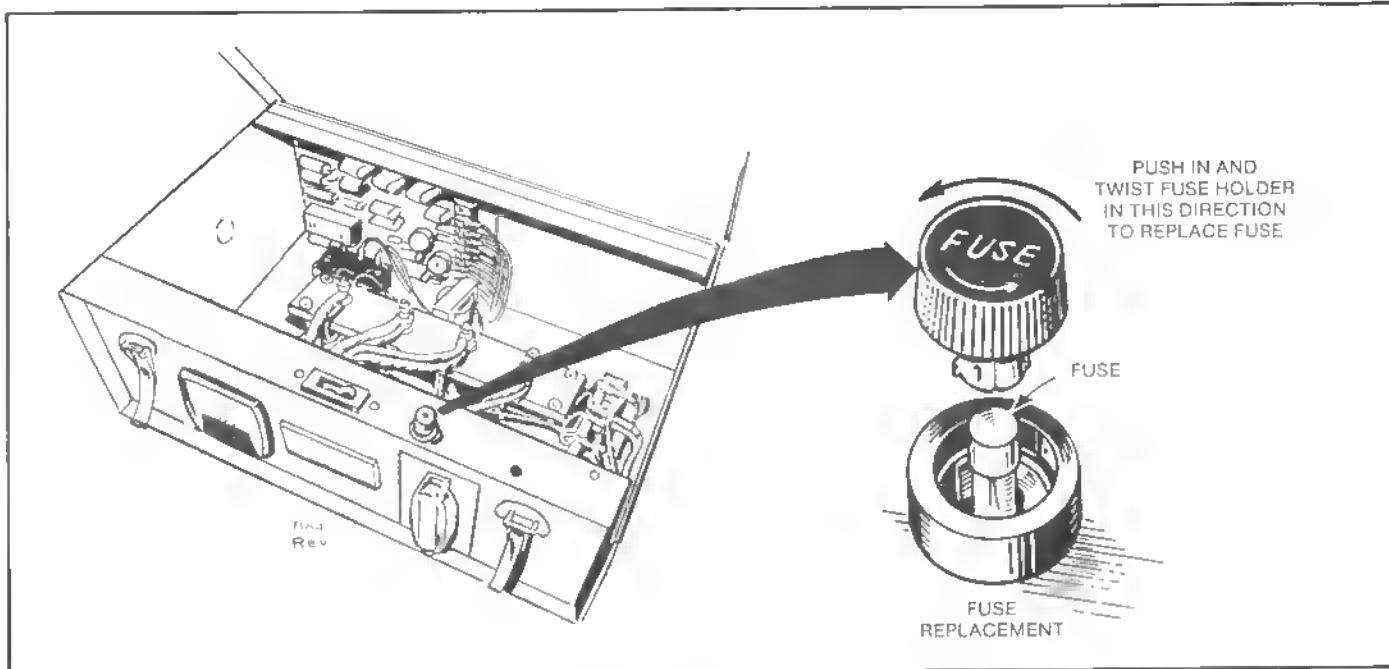


FIGURE 10. CONTROL BOX INTERIOR AND FUSE REPLACEMENT

ALTERNATOR TROUBLESHOOTING GUIDE

NATURE OF TROUBLE	PROBABLE CAUSE
No output voltage.	<ol style="list-style-type: none"> Check load circuit breaker for a tripped position; an external short or overload may have caused this condition. Remove part of the load before resetting breaker. Check exciter circuit breaker for a tripped position. Correct problem before resetting. Check tractor PTO speed—should be 540 rpm or 1000 rpm, whichever applies.
No output voltage from 120-volt duplex receptacle.	<ol style="list-style-type: none"> Blown fuse—open control box cover and replace fuse with Buss ABC 15 or equivalent.
Low frequency—alternator will not maintain 60 Hertz.	<ol style="list-style-type: none"> Check engine PTO speed—should be 540 rpm or 1000 rpm, whichever applies.
Alternator overheats.	<ol style="list-style-type: none"> Overloaded—remove part of load. Poor ventilation—check alternator's air intake and outlet for restrictions.

If alternator does not produce current after making these checks, contact your nearest Onan Service Center.

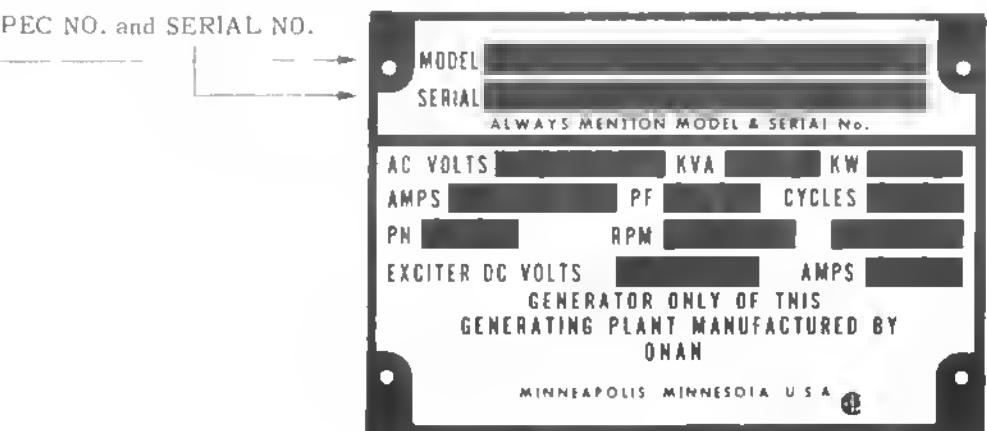
PARTS CATALOG

INSTRUCTIONS FOR ORDERING REPAIR PARTS

For parts or service, contact the dealer from whom you purchased this equipment or refer to your Nearest Authorized Parts & Service Center.

To avoid errors or delay in filling your parts order, please furnish all information requested.

Always give the MODEL & SPEC NO. and SERIAL NO.



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**971-0007 (5-80)
UR PARTS CATALOG**

INTRODUCTION

This catalog applies to the standard UR Alternators listed below. Parts are arranged in groups of related items. Each illustrated part is identified by a reference number corresponding to the same reference number in the parts list for that group. Parts illustrations are typical. Unless otherwise mentioned in the description, parts are interchangeable between models. Right and left sides are determined by facing the PTO shaft end (front) of the set.

ALTERNATOR DATA TABLE

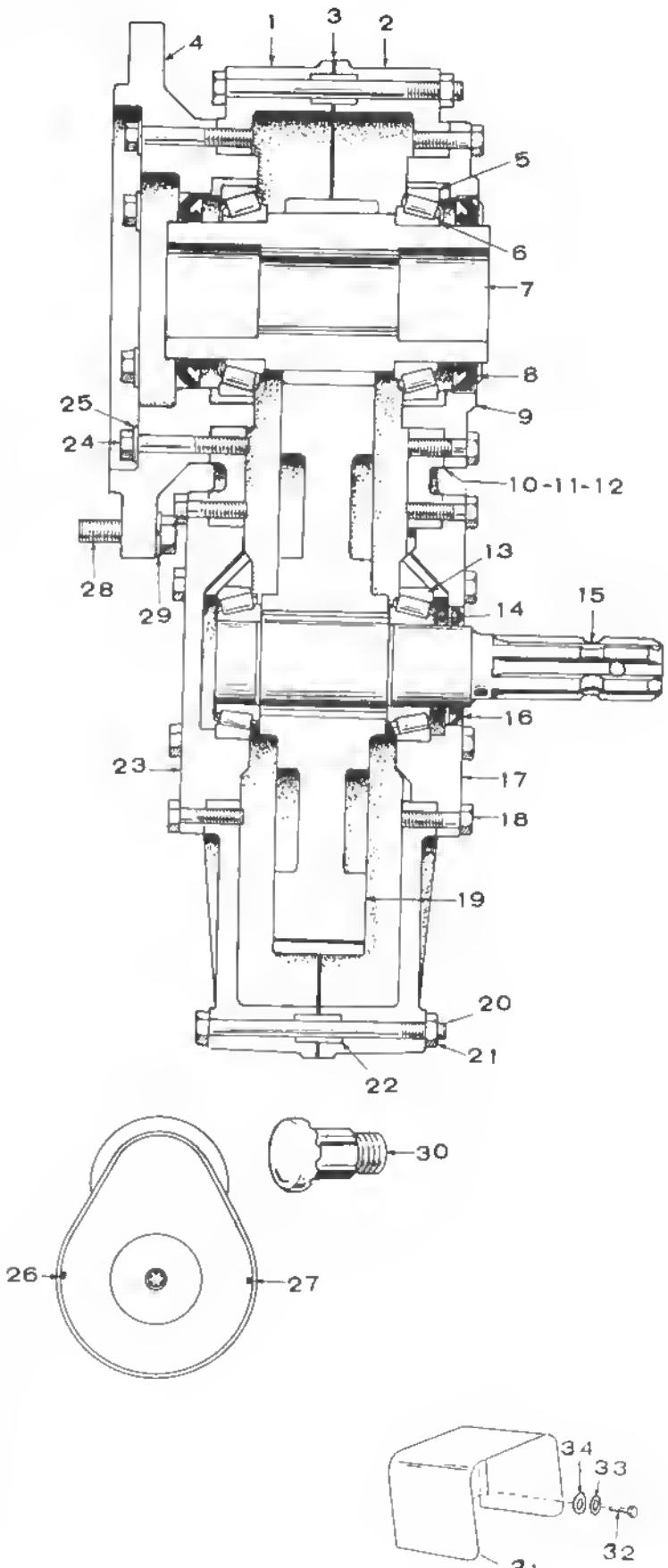
MODEL & SPEC NO.	ELECTRICAL DATA				
	WATTS	VOLTS	HERTZ	WIRE	PHASE
40.0UR-3G/*	40,000	120/240	60	3	1
40.0UR-5DG/*	40,000	120/240△	60	4	3
45.0UR-3G/*	45,000	120/240	60	3	1
45.0UR-5DG/*	45,000	120/240△	60	4	3
55.0UR-3G/*	55,000	120/240	60	3	1
55.0UR-5DG/*	55,000	120/240△	60	4	3
65.0UR-3G/*	65,000	120/240	60	3	1
65.0UR-5DG/*	65,000	120/240△	60	4	3
80.0UR-5DG/*	80,000	120/240△	60	4	3

△ - Reconnectible to also deliver 120/208, three phase.

* - The specification letter advances (A to B, B to C, etc.,) with manufacturing changes.

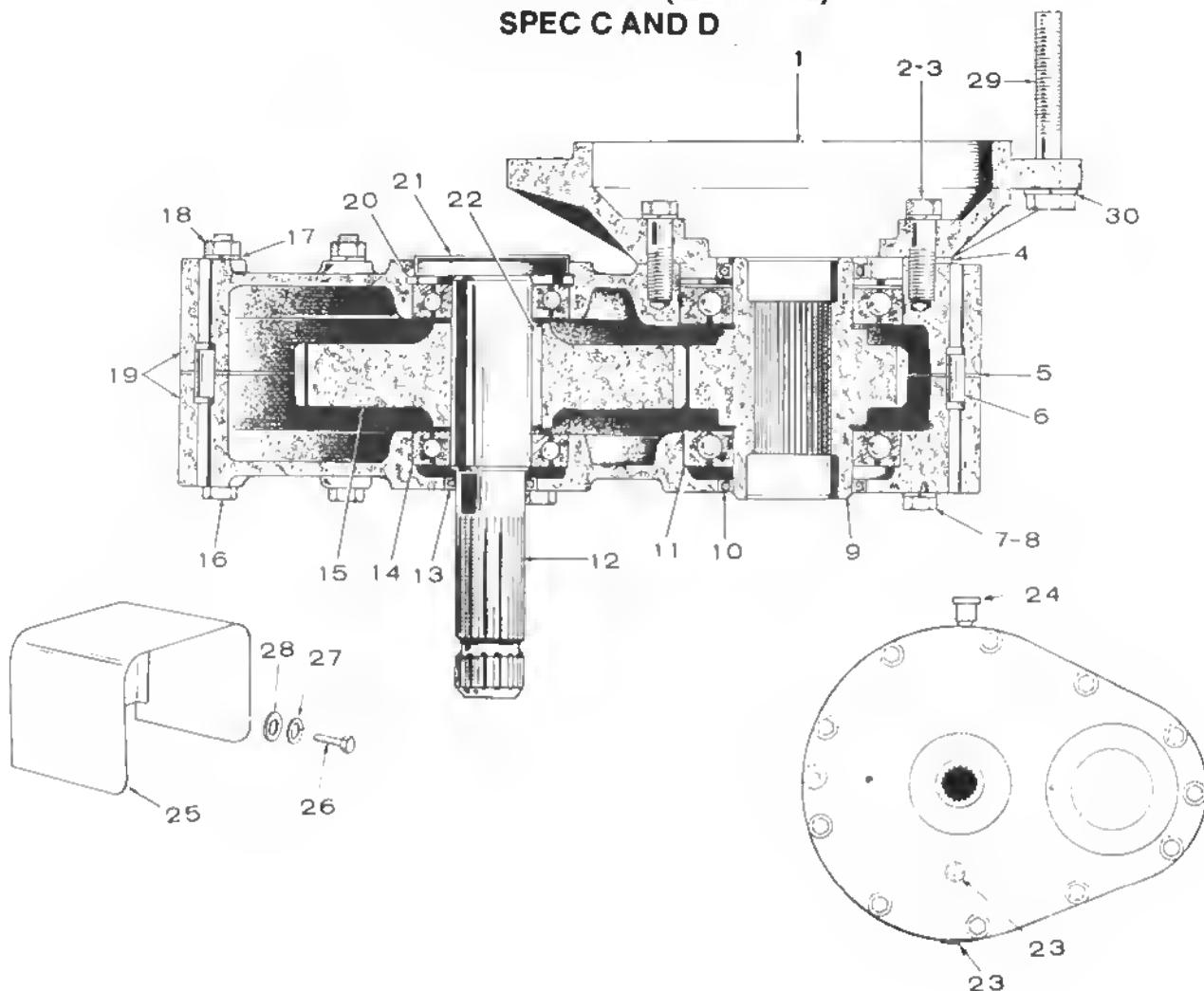
GEAR DRIVE BOX (540 AND 1000 RPM)
SPEC A AND B

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
GEAR BOX - COMPLETE			
	190-0303	1	540 rpm
	190-0327	1	1000 rpm
1 CASE (Less Pipe Plugs)			
	190-0329	1	540 rpm
	190-0388	1	1000 rpm
2 CASE (Includes Pipe Plugs)			
	190-0330	1	540 rpm
	190-0389	1	1000 rpm
3	190-0331	1	Gasket
4	FLANGE		
	190-0332	1	540 rpm
	190-0390	1	1000 rpm
5	190-0333	2	Cup, Bearing
6	190-0334	2	Cone, Bearing
7	SHAFT AND GEAR		
	190-0335	1	540 rpm
	190-0391	1	1000 rpm (Input Shaft Only)
8	SEAL		
	190-0336	2	540 rpm
	190-0392	2	1000 rpm
9	PLATE, OPEN END		
	190-0337	1	540 rpm
	190-0393	1	1000 rpm
10	190-0338	As Req.	Shim .001" Thk (Clear)
11	190-0339	As Req.	Shim .003" Thk (Green)
12	190-0340	As Req.	Shim .005" Thk (Blue)
13	190-0341	2	Cup, Bearing
14	190-0342	2	Cone, Bearing
15	SHAFT, SPLINED		
	190-0343	1	540 rpm
	190-0394	1	1000 rpm
16	SEAL		
	190-0344	1	540 rpm
	190-0395	1	1000 rpm
17	PLATE, OPEN END		
	190-0345	1	540 rpm
	190-0396	1	1000 rpm
18	190-0346	t8	Screw, Cap
19	GEAR		
	190-0347	1	540 rpm
	190-0397	1	1000 rpm
20	190-0348	16	Screw, Cap
21	190-0349	16	Nut
22	190-0350	2	Bushing, Lineup
23	PLATE, CLOSED END		
	190-0351	1	540 rpm
	190-0398	1	1000 rpm
24	190-0352	6	Screw, Cap
25	190-0353	6	Washer, Lock
26	190-0354	1	Plug
27	190-0355	2	Plug, Drain
28	190-0356	2	Screw, Cap
29	190-0357	2	Washer, Lock
30	518-0275	1	*Cap, Vent
31	190-0313	1	*Guard, Power Take Off
32	800-0132	1	*Screw, Cap - Hex Head Guard Mounting (5/8-11 x 1-1/2")
33	850-0070	1	*Washer, Lock - Spring Guard Mounting (5/8")
34	850-0060	4	*Washer, Lock - Spring Gear Box Mounting (1/2")
35	526-0242	1	*Washer, Flat - Guard Mounting (.688" ID x 2.87" OD x .250" Thk)
36	190-0399	1	Gear, Input (1000 rpm Only)
37	190-0400	1	Key, Input Gear (100 rpm Only)



NOTE: Order parts that do not have an asterisk (*) from
Von Ruder Manufacturing Company
Claremont, Minnesota 55924

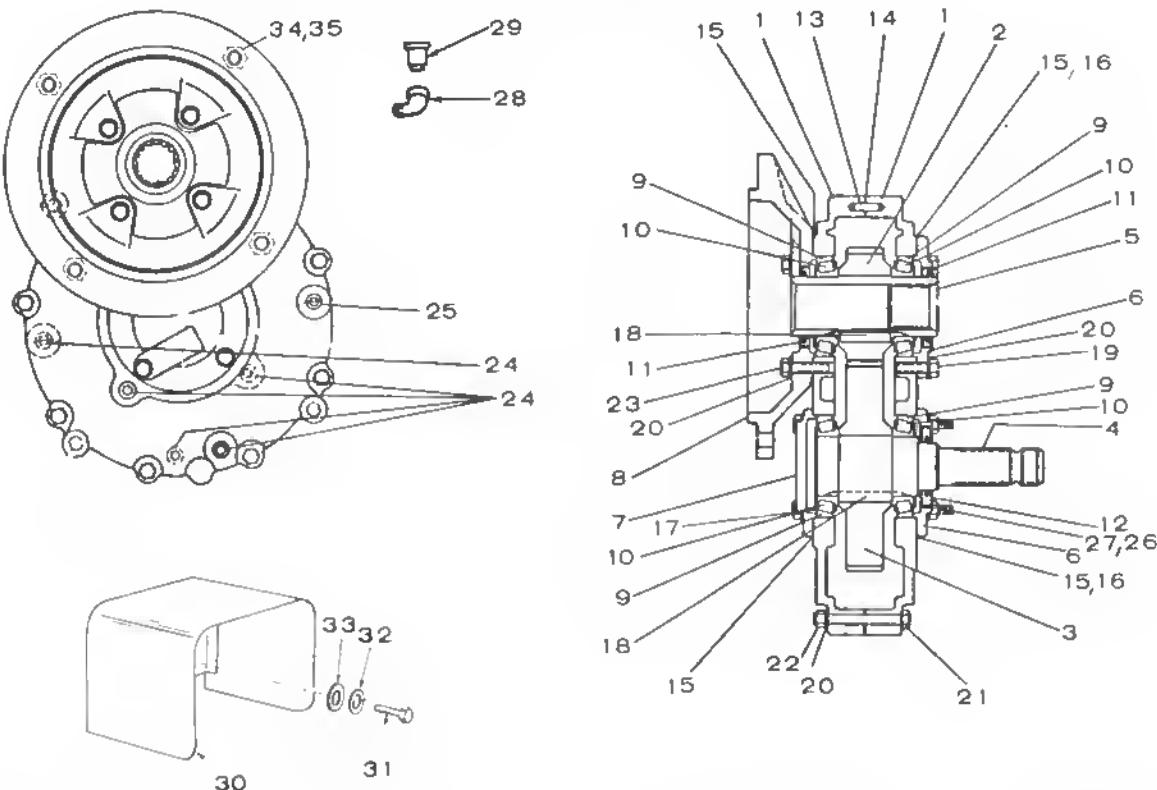
**GEAR DRIVE BOX (1000 RPM)
SPEC C AND D**



REF. NO.	PART NO.	QTY. USEO	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USEO	PART DESCRIPTION
	t90-0413	1	Gear Drive Box - Complete	19	190-0422	1	Case
1	190-0417	1	Flange, Mounting	20	190-0428	1	Ring, Retaining
2	800-0093	4	Screw, Cap - Hex Head (1/2-13 x 1-3/4" lg)	21	190-0416	1	Cap, Dust
3	850-0060	4	Washer, Lock - Spring (1/2")	22	10250'	1	Key (3/8" x 3/8" x 2" lg)
4	190-0418	1	Shim, Flange to Case	23	10166'	2	Plug, Drain and Fill
5	190-0419	1	Gasket, Case	24	518-0275	1	Cap, Vent
6	10167'	2	Pin, Dowel	25	190-0384	1	Guard, Power Take Off
7	850-0045	4	Washer, Lock - Spring (5/16")	26	800-0028	3	Screw, Cap - Hex Head - Guard Mounting (5/16-18 x 1" lg)
8	800-0037	4	Screw, Cap - Hex Head (5/16-18 x 3" lg)	27	850-0045	3	Washer, Lock - Spring - Guard Mounting (5/16")
9	190-0420	1	Gear, Output	28	526-0030	4	Washer, Flat - Guard Mounting (13/32" ID x 7/8" OD x 1/8" Thk)
10	190-0426	2	Seal, Output Gear	29	800-0092	4	Screw, Cap - Hex Head - Gearbox Mounting (1/2-13 x 1-1/2" lg)
11	190-0427	2	Bearing, Ball - Output Gear	30	850-0060	4	Washer, Lock - Spring - Gearbox Mounting (1/2")
12	190-0423	1	Shaft, Input (Splined)				
13	190-0425	2	Seal, Input Shaft				
14	190-0424	2	Bearing, Ball (Input Shaft)				
15	190-0421	1	Gear, Input				
16	800-0043	6	Screw, Cap - Hex Head (5/16-18 x 5" lg)				
17	850-0045	6	Washer, Lock - Spring (5/16")				
18	862-0015	6	Nut, Hex (5/16-18)				

- These Part Numbers are Apex Part Numbers.
Order these Parts from: Apex Industries, 114 East Main
Waterville, Minnesota

GEAR DRIVE BOX (1000 RPM) - BEGIN SPEC E

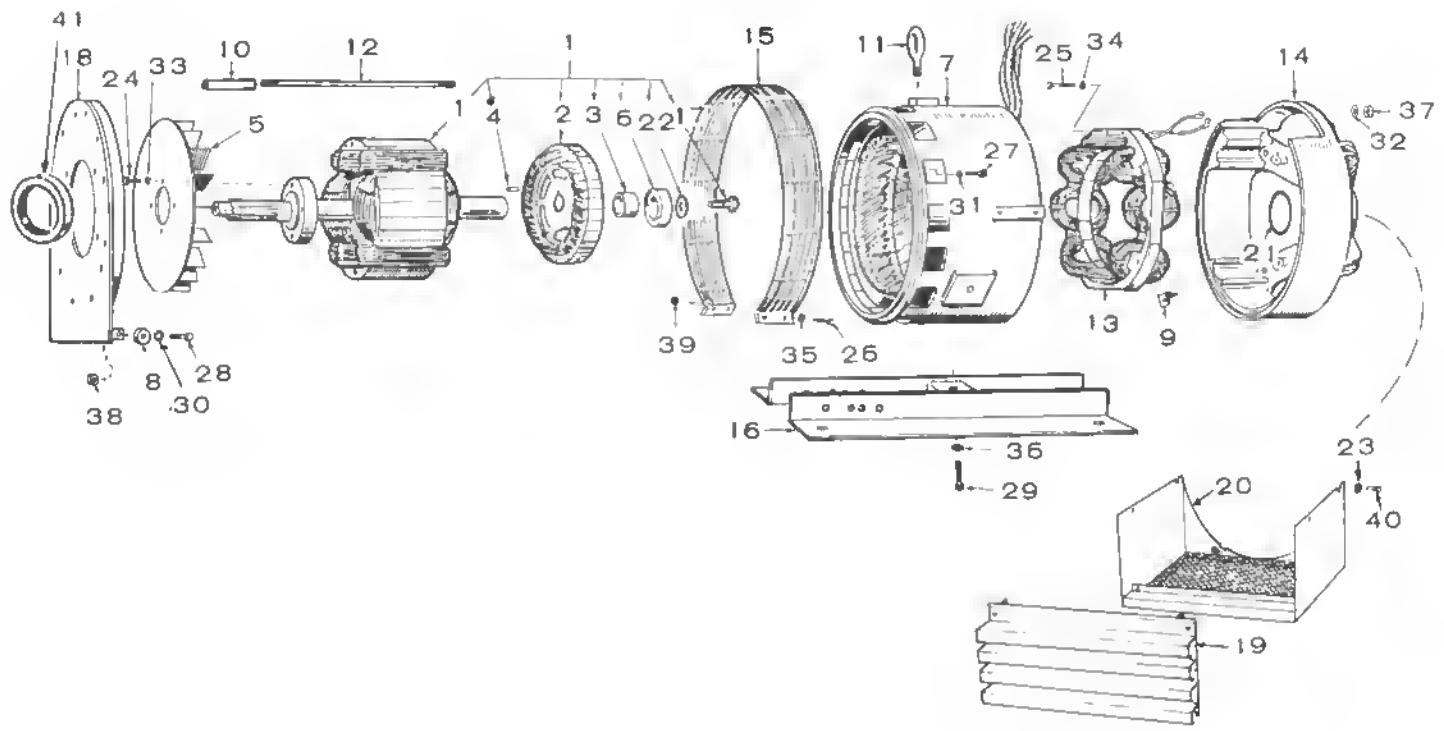


REF. NO.	PART NO.	OTY. USED	PART DESCRIPTION
GEAR DRIVE BOX - COMPLETE (Terrell)			
	190-0538	1	Spec E
	190-0578	1	Begin Spec G
1	HOUSING (HALF)		
	190-0548	2	Spec E
	190-0590	2	Begin Spec G
2	190-0549	1	Gear, Pinion (40 Teeth)
3	190-0550	1	Gear (72 Teeth)
4	190-0551	1	Shaft, Input - Splined
5	190-0552	1	Shaft, Output - Splined
6	COVER		
	190-0553	2	Spec E
	190-0589	2	Begin Spec G
7	COVER		
	190-0554	1	Spec E
	190-0588	1	Begin Spec G
8	FLANGE, GENERATOR		
	190-0555	1	Spec E
	190-0587	1	Begin Spec G
9	190-0556	4	Cup, Bearing
10	190-0557	4	Cone, Bearing
11	190-0558	2	Seal, Output Shaft
12	190-0559	1	Seal, Input Shaft
13	PIN, OOWEL		
	516-0024	2	5/16 x 1" - Spec E
	516-0010	2	1/4 x 1" - Begin Spec G
14	GASKET, HOUSING		
	190-0560	1	Spec E
	190-0586	1	Begin Spec G
15	190-0585	4	Shim, Fibre (.005") - Begin Spec G
16	SHIM		
	190-0561	As Req	Spec E
	190-0562	As Req	.005"
	190-0563	As Req	.007"
			.020"
			Begin Spec G
	190-0582	As Req	.020"
	190-0583	As Req	.007"
	190-0584	As Req	.005"

REF. NO.	PART NO.	OTY. USED	PART DESCRIPTION
17	190-0580	3	Spacer, Ring - Begin Spec G
18	190-0564	2	Key, Square (3/8 x 1-7/8")
19	SCREW, CAP - HEX HEAD		
	800-0051	8	3/8-16 x 1-1/4" - Spec E
	800-0512	18	5/16-18 x 1" - Begin Spec G
20	WASHER, LOCK - SPRING		
	850-0050	26	3/8" - Spec E
	850-0050	10	3/8" - Begin Spec G
	850-0045	32	5/16" - Begin Spec G
21	800-0059	10	Screw, Cap - Hex Head (3/8-16 x 3-1/4")
22	NUT, HEX (3/8-16)		
	862-0003	14	Spec E
	862-0003	10	Begin Spec G
23	SCREW, CAP - HEX HEAD		
	800-0052	4	3/8-16 x 1-1/2" - Spec E
	800-0548	6	5/16-18 x 1-1/2" - Begin Spec G
24	PLUG, PIPE		
	190-0565	9	Spec E
	505-0058	8	3/8-18 NPT - Begin Spec G
25	190-0566	1	Plug, Plastic - Spec E
26	862-0015	4	Nut, Hex (5/16-18) - Begin Spec G
27	STUO		
	190-0568	4	3/8 x 2" - Spec E
	190-0581	4	5/16-18 x 2" - Begin Spec G
28	505-0120	1	Elbow, Pipe - Street (3/8" x 90°) - Spec E
29	518-0275	1	Vent, Gear Box
30	190-0384	1	Guard, Power Take-Off
31	800-0132	1	Screw, Cap - Hex Head (5/8-11 x 1-1/2")
32	850-0070	1	Washer, Lock - Spring (5/8")
33	526-0288	1	Washer, Flat (Special)
34	850-0060	4	Washer, Lock - Spring (1/2")
35	800-0091	4	Screw, Cap - Hex Head (1/2-13 x 1-1/4")

971-0007 (MAY 1980)

GENERATOR

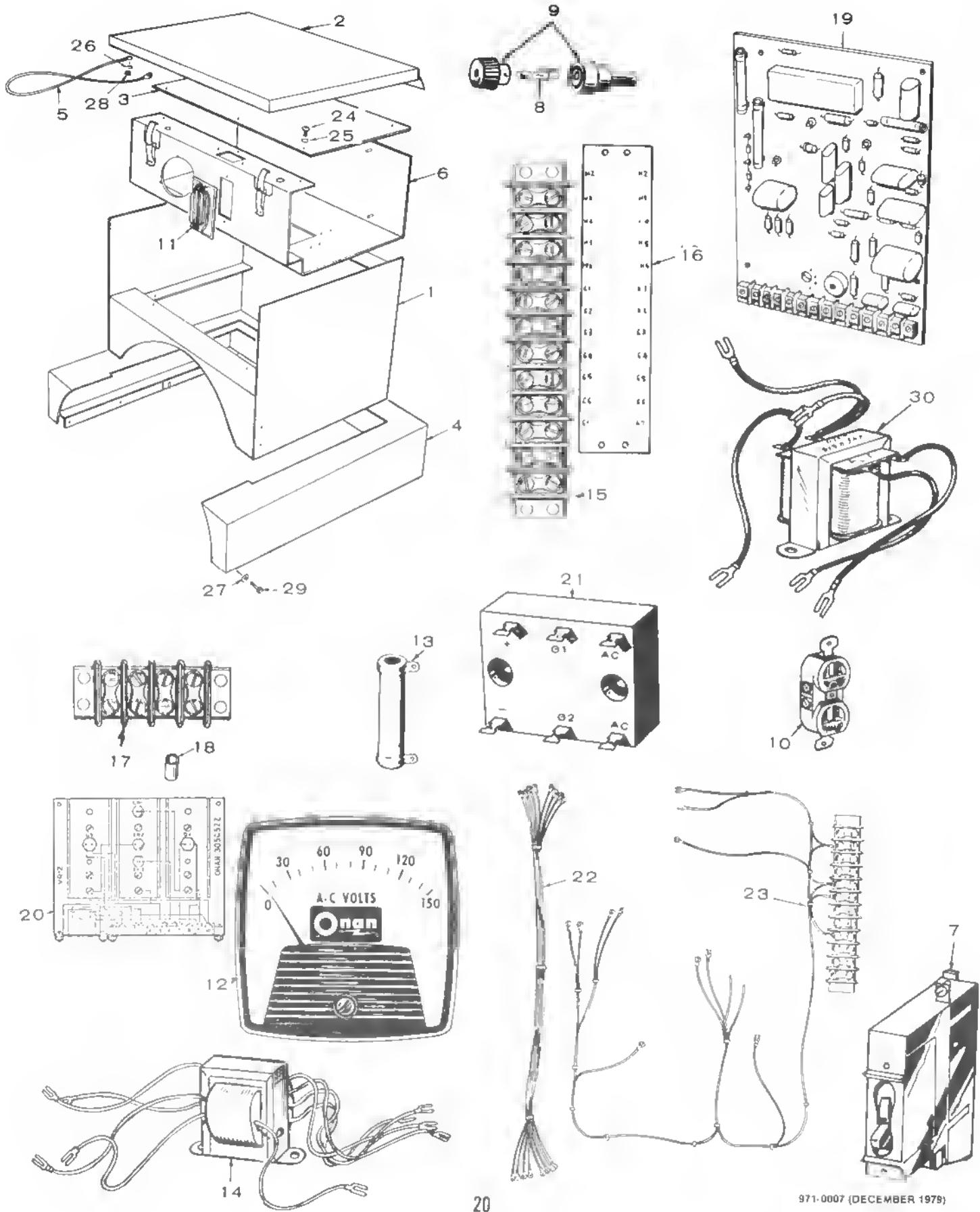


GENERATOR

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	ROTOR ASSEMBLY, WOUND (Includes Parts Marked *) Spec A & B			23	526-0018	3	Washer, Flat - End Bell Wrapper Mounting (17/64" ID x 5/8" OD x 1/16" Thk)
201-1975	1	40 kW, 1 Phase		24	800-0049	4	Screw, Cap - Hex Head - Blower Mounting (3/16-18 x 7/8")
201-1974	1	40 kW, 3 Phase		25	800-0009	4	Screw, Cap - Hex Head - Exciter Stator Mounting (1/4-20 x 1-1/2" lg)
201-1977	1	55 kW, 1 Phase		26	800-0009	2	Screw, Cap - Hex Head - Screen Mounting (1/4-20 x 1-1/2" lg)
201-1976	1	55 kW, 3 Phase		27	800-0050	8	Screw, Cap - Hex Head - Stator to Adapter (3/8-16 x 1")
	Begin Spec C			28	800-0090	2	Screw, Cap - Hex Head - Generator Adapter Spacer Mounting (1/2-13 x 1")
201-2364	1	40 kW and 45 kW, 1 Phase		29	800-0152	1	Screw, Cap - Hex Head - Base to Stator Assembly (3/4-10 x 1-1/4")
201-2363	1	40 kW, 3 Phase		30	850-0060	2	Washer, Lock - Spring - Generator Adapter Spacer Mounting (1/2")
201-2364	1	45 kW, 3 Phase		31	850-0050	8	Washer, Lock - Spring - Stator to Adapter Mounting (3/8")
201-2366	1	55 kW and 65 kW, 1 Phase		32	850-0050	4	Washer, Lock - Spring - Generator Through Stud (3/8")
201-2365	1	55 kW and 65 kW, 3 Phase		33	850-0050	4	Washer, Lock - Spring - Blower Mounting (3/8")
201-2367	1	80 kW, 3 Phase		34	850-0040	4	Washer, Lock - Spring - Exciter Stator Mounting (1/4")
2	201-1739	1	'Rotor Assembly, Wound Exciter (See Separate Group for Components)	35	850-0040	2	Washer, Lock - Spring - Screen Mounting (1/4")
3	232-2102	1	'Spacer, Bearing	36	850-0079	1	Washer, Lock - Spring - Base to Stator Assembly (3/4")
4	515-0145	1	'Key, Exciter Rotor Mounting	37	862-0011	4	Nut, Hex - Generator Through Stud (3/8-16")
5	205-0098	1	'Blower	38	862-0016	2	Nut, Hex - Generator Adapter Spacer Mounting (1/2-13)
6	510-0101	1	'Bearing, Ball	39	862-0001	2	Nut, Hex - Screen Mounting (1/4-20)
7	STATOR ASSEMBLY, WOUND			40	821-0014	4	Screw, Locking Head - End Bell Wrapper Mounting (5/16-18 x 1/2")
	220-1878	1	40 kW and 45 kW, 1 Phase	41	232-2664	1	Spacer, Generator Shat - 80 kW, 3 Phase
	220-1865	1	40 kW, 3 Phase				
	220-1866	1	45 kW, 3 Phase				
	220-1880	1	55 kW and 65 kW, 1 Phase				
	220-1867	1	55 kW and 65 kW, 3 Phase				
	220-1869	1	80 kW, 3 Phase				
8	232-2284	2	Spacer, Generator Adapter Spec A and B				
9	234-0429	2	Bracket, End Bell Cover				
10	503-0611	4	Hose, Vibration Dampener				
11	403-0931	1	Eyebolt, Lifting				
12	STUD, ALTERNATOR THROUGH						
	520-0721	4	40 kW and 45 kW, 1 Phase				
	520-0720	4	40 kW, 3 Phase				
	520-0721	4	45 kW, 3 Phase				
	520-0723	4	55 kW and 65 kW, 1 Phase				
	520-0722	4	55 kW and 65 kW, 3 Phase				
	520-0724	1	80 kW, 3 Phase				
13	STATOR ASSEMBLY, WOUND EXCITER						
	220-1528	1	Spec A				
	220-2353	1	Begin Spec C				
14	211-0185	1	Bell, End				
15	234-0368	1	Screen, Alternator				
16	403-0985	1	Base, Alternator Mounting				
17	800-0513	1	'Screw, Cap - Hex Head Bearing Relainer Mounting (3/4-10 x 1-1/2")				
18	231-0204	1	Adapter, Alternator				
19	234-0458	1	Grille, Alternator Air Inlet				
20	234-0459	1	Wrapper, Alternator End Bell				
21	509-0125	1	Seal, "O" Ring - Bearing				
22	526-0238	1	'Washer, Flat - Bearing Relainer (13/16" ID x 2" OD x 3/16" Thk)				

* - Parts Included in Wound Rotor Assembly.

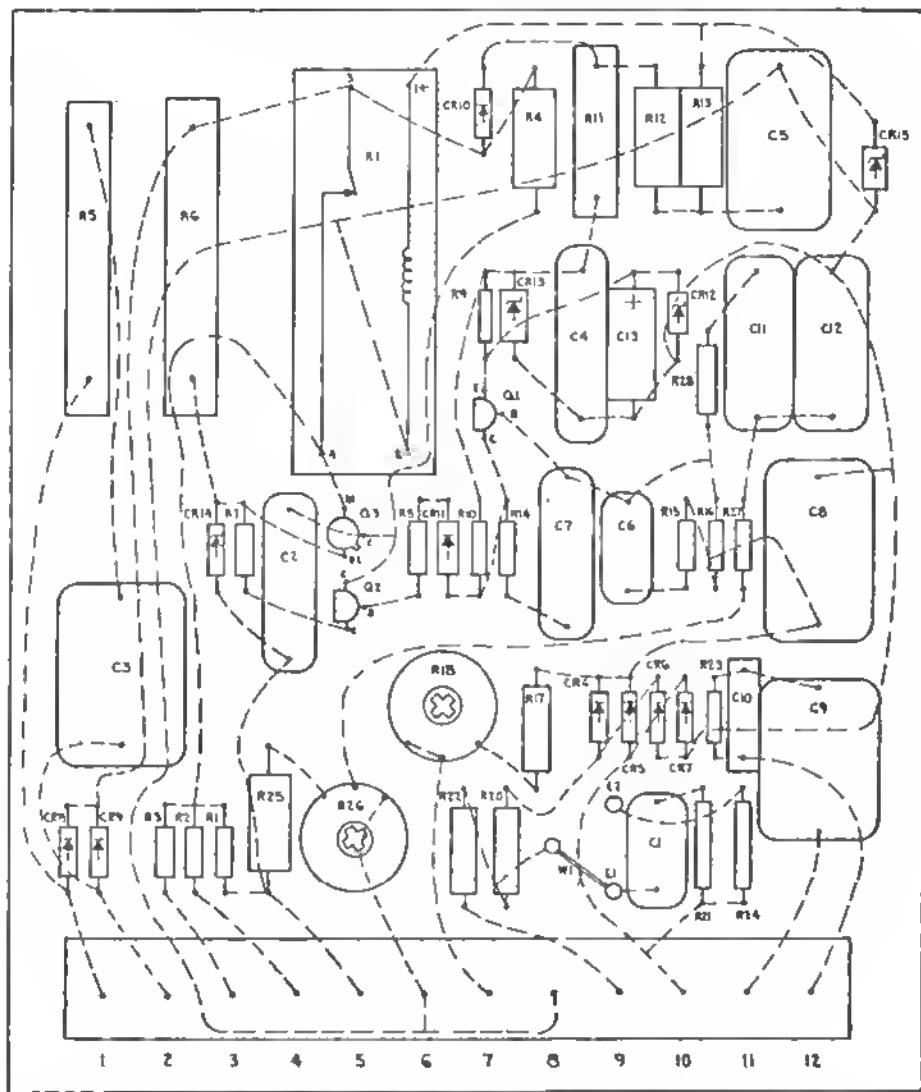
CONTROL



CONTROL

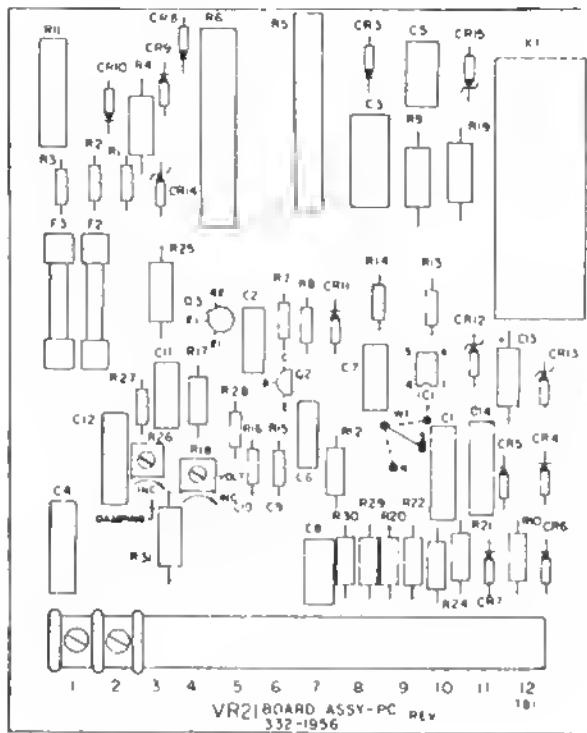
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	301-3537	1	Box, Control	20	305-0522	1	Chassis Assembly, Voltage Regulator (See Separate Group for Components) Spec A & B
2	301-3539	1	Cover, Control Box	21	305-0524	1	Rectifier, Bridge (SCR) - Begin Spec C
3	301-3533	1	Plate, Control Box Cover	22	338-1062	1	Harness, Wiring - Voltage Regulator
4	301-3536	1	Support, Control Box	23	338-0615	1	Harness, Wiring - Control
5	406-0341	1	Holder, Control Box Cover	24	815-0026	15	Screw, Machine - Truss Head Control Box (10-32 x 3/8")
6	301-3538	1	Chassis, Control	25	850-0030	15	Washer, Lock - Spring Control Box (1/4")
7	320-0431	1	Breaker, Circuit (2 Amp)	26	850-0020	1	Washer, Lock - Spring - Control Cover Holder (#6)
8	321-0138	1	Fuse, Cartridge (15 Amp)	27	526-0018	1	Washer, Flat - Control Box Support Mounting (13/32" ID x 3/4" OD x 1/16")
9	321-0104	1	Holder, Fuse	28	870-0131	1	Nut, Hex - W/ET (10-32)
10	323-0184	1	Receptacle, Duplex	29	821-0010	20	Screw, Locking Head - Control Box Support Mounting (1/4-20 x 1/2")
11	323-0806	1	Cover, Receptacle	30	315-0343	1	Reactor, Commutator - Begin Spec C
12	302-1036	1	Voltmeter				
13	351-0216	1	Resistor (1740 Ohm, 1/4 Watt)				
14	TRANSFORMER, VOLTAGE						
	315-0342	1	Spec A through D				
	315-0431	1	Begin Spec E				
15	332-0607	1	Block, Terminal (12 Place)				
16	332-1248	1	Strip, Marker (12 Place)				
17	332-0513	1	Block, Terminal (4 Place)				
18	301-0458	4	Spacer, Terminal Block Mounting				
19	BOARD ASSEMBLY, PRINTED CIRCUIT (See Separate Group for Components)						
	332-1268	1	Spec A through D				
	332-1956	1	Begin Spec E				

**PRINTED CIRCUIT BOARD ASSEMBLY
(332-1268) - SPEC A THROUGH D**



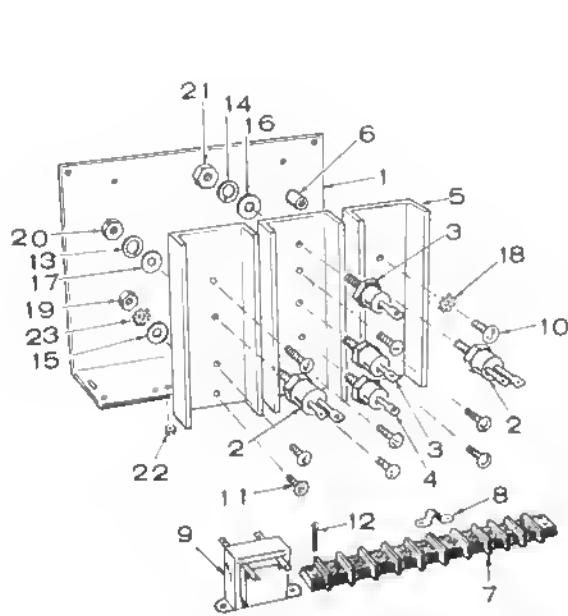
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
TB1	332-1252	1	Terminal Block	R6	353-0039	1	Resistor, Fixed (5,000-Ohm, 15 Watt)
C1	355-0018	1	Capacitor (.47 Mfd., 100 Volt)	R7	350-0398	1	Resistor (3,000-Ohm, 1/2 Watt)
C2, C7	355-0005	2	Capacitor (.22 Mfd., 200 Volt)	R8, R16	350-0447	2	Resistor (330,000-Ohm, 1/2 Watt)
C3, C9	355-0017	2	Capacitor (.47 Mfd., 400 Volt)	R9, R10	350-0423	2	Resistor (33,000-Ohm, 1/2 Watt)
C4, C12	355-0006	2	Capacitor (.47 Mfd., 200 Volt)	R11, R12	352-0151	2	Resistor, Fixed (15,000- Ohm, 5 Watt)
C5, C8	355-0016	2	Capacitor (1 Mfd., 100 Volt)	R13	350-1007	1	Resistor (6,800-Ohm, 2 Watt)
C6	355-0015	1	Capacitor (.1 Mfd., 200 Volt)	R14	350-0443	1	Resistor (220,000-Ohm, 2 Watt)
C10	355-0014	1	Capacitor (.047 Mfd., 200 Volt)	R15, R27	350-0435	2	Resistor (100,000-Ohm, 1/2 Watt)
C11	355-0020	1	Capacitor (.1 Mfd., 400 Volt)	R17	351-0521	1	Resistor, Metal Film (12,100 Ohm, 1/4 Watt)
C13	356-0039	1	Capacitor (100 Mfd., 10 Volt)	R18	303-0168	1	Potentiometer
CR4 thru 11	357-0014	8	Rectifier, Silicon	R20, R22	351-0520	2	Resistor, Metal Film (28,000-Ohm, 1/4 Watt)
CR12	359-0016	1	Diode, Zener (6.8 Volt)	R21	351-0522	1	Resistor, Metal Film (5,110-Ohm, 1/4 Watt)
CR13	359-0025	1	Diode, Zener (20 Volt)	R24	351-0523	1	Resistor, Metal Film (8,870-Ohm, 1/4 Watt)
CR14	359-0026	1	Diode, Zener (18 Volt)	R25	350-1011	1	Resistor (10,000-Ohm, 2 Watt)
CR15	359-0015	1	Diode, Zener (24 Volt)	R26	303-0164	1	Potentiometer
K1	307-1063	1	Relay, Magnetic Reed	R28	350-0459	1	Resistor (1.0 Megohm, 1 Watt)
Q1, Q2	362-0017	2	Transistor, Silicon (NPN)		517-0127	2	Cover, Potentiometer (Not Illustrated)
Q3	361-0004	1	Transistor, Unijunction				
R1, R23	350-0355	2	Resistor (47-Ohm, 1/2 Watt)				
R2, R3	350-0351	2	Resistor (33-Ohm, 1/2 Watt)				
R4	350-1075	1	Resistor (4.7 Megohm, 2 Watt)				
R5	353-0040	1	Resistor, Fixed (270-Ohm, 10 Watt)				

**PRINTED CIRCUIT BOARD ASSEMBLY
(332-1956) - BEGIN SPEC E**



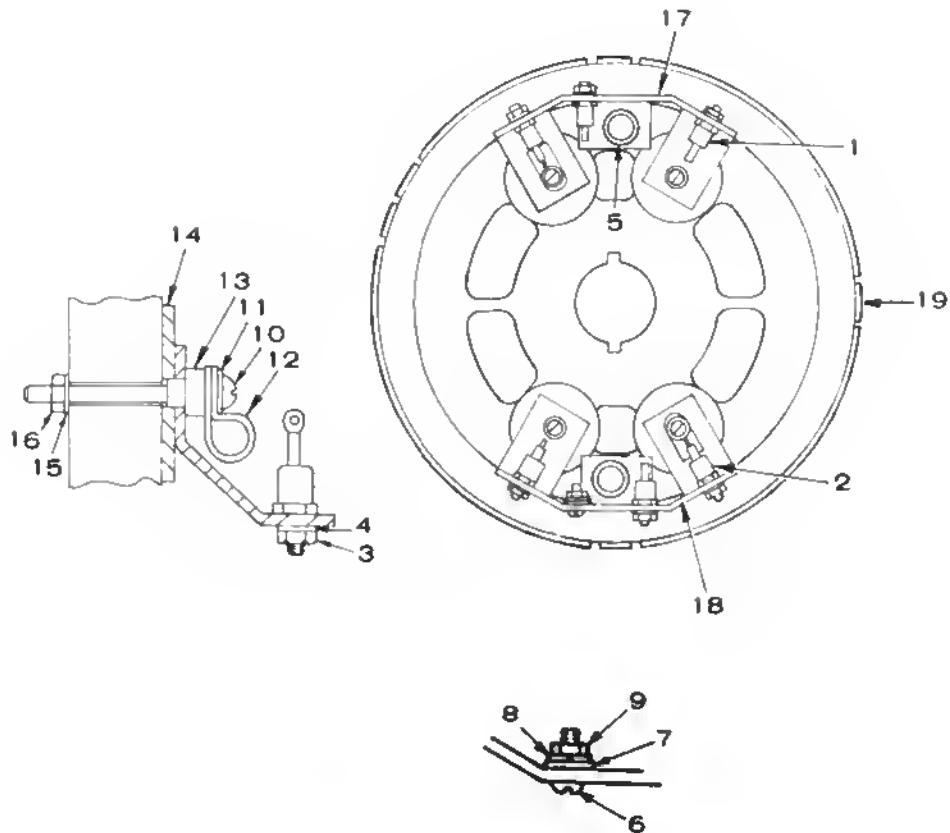
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	
	332-1956	1	Board Assembly, Printed - Complete	R7	350-0398	1	Resistor - 1/2 Watt, 3,000-Ohm	
C1,14	355-0042	2	Capacitor - 47 Mfd, 250 Volt	R8, R16	350-0447	2	Resistor - 1/2 Watt, 330,000-Ohm	
C2, C7	355-0043	2	Capacitor - 22 Mfd, 250 Volt	R10	351-0885	1	Resistor - 1/2 Watt, 51,100-Ohm	
C3	355-0047	1	Capacitor - 47 Mfd, 400 Volt	R9, R11	352-0151	2	Resistor - Fixed 5 Watt, 15,000-Ohm	
C4, C12	355-0044	2	Capacitor - 47 Mfd, 250 Volt	R12	351-0909	1	Resistor - 1/2 Watt, 90,900-Ohm	
C5, C8	355-0046	2	Capacitor - 1 Mfd, 100 Volt	R13	350-0411	1	Resistor - 1/2 Watt, 10,000-Ohm	
C6	355-0056	1	Capacitor - 33 Mfd, 250 Volt	R14	350-0443	1	Resistor - 1/2 Watt, 220,000-Ohm	
C11	355-0048	1	Capacitor - 1 Mfd, 400 Volt	R15, R27	350-0435	2	Resistor - 1/2 Watt, 100,000-Ohm	
C13	356-0039	1	Capacitor - Electrolytic 100 Mfd, 10 Volt	R17	351-0293	1	Resistor, Metal Film - 1/4 Watt, 11,000-Ohm	
CR3	357-0014	9	Rectifier - Silicon	R18	303-0210	1	Potentiometer - 5,000-Ohm, 1/2 Watt	
CR12	359-0036	1	Diode - Zener 5.6 Volt	R20, 22	29 & 30	351-0520	4	Resistor - 1/4 Watt, 28,000-Ohm
CR13	359-0025	1	Diode - Zener 20 Volt	R21	351-0522	1	Resistor - Metal Film - 1/4 Watt, 5,110-Ohm	
CR14	359-0026	1	Diode - Zener 18 Volt	R24	351-0523	1	Resistor - Metal Film - 1/4 Watt, 8,870-Ohm	
F2,F3	321-0204	2	Fuse, 1/4 Amp	R25, R31	350-1011	2	Resistor - 2 Watt, 10,000-Ohm	
IC1	367-0005	1	Integrated Circuit	R26	303-0211	1	Potentiometer - 1/2 Watt, 100,000-Ohm	
Q2	362-0017	1	Transistor - Silicon NPN	R28	350-0568	1	Resistor - 1/2 Watt, 47 Meg-Ohm	
O3	361-0004	1	Transistor - Unijunction	TB1	332-1252	1	Terminal Block	
R1	350-0355	1	Resistor - 1/2 Watt, 47-Ohm	CR15	359-0015	1	Diode - Zener - 24 Volt	
R2, R3	350-0351	2	Resistor - 1/2 Watt, 33-Ohm		321-0163	6	Clip - Fuse	
R4	350-1075	1	Resistor - 2 Watt, 4.7 Meg-Ohm	K1	307-1063	1	Relay, Magnetic Reed	
R5	353-0040	1	Resistor - Fixed 10 Watt, 270-Ohm	R19	350-1007	1	Resistor - 2 Watt, 6,800-Ohm	
R6	353-0039	1	Resistor - Fixed 15 Watt, 5,000-Ohm					

VOLTAGE REGULATOR CHASSIS
SPEC A AND B



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	305-0521	1	Chassis, Voltage Regulator
2	364-0014	2	Rectifier, Gate Control
3	358-0035	2	Rectifier, Diode
4	358-0029	1	Rectifier, Diode
5	363-0048	3	Heat Sink, Rectifier
6	332-1265	6	Insulator, Stand Off
7	332-1266	1	Block, Terminal (10 Phase)
8	332-1043	2	Jumper, Terminal Block
9	315-0343	1	Reactor, Commutator
10	812-0079	3	Screw, Machine - Round Head Heat Sink Mounting (8-32 x 1/2")
11	812-0077	14	Screw, Machine - Round Head Voltage Regulator Mounting (8-32 x 3/8")
12	812-0081	2	Screw, Machine - Round Head Terminal Block Mounting (8-32 x 5/8")
13	850-0040	2	Washer, Lock - Spring - Gate Control Rectifier Mounting (1/4")
14	850-0030	3	Washer, Lock - Spring Diode Rectifier Mounting (#10)
15	526-0048	3	Washer, Flat - Heat Sink Mounting (.172" ID x 3/8" OD x 1/32" Thk)
16	526-0009	3	Washer, Flat Diodes Rectifier Mounting (7/32" ID x 1/2" OD x 1/16" Thk)
17	526-0018	2	Washer, Flat - Gate Control Rectifiers Mounting (17/64" ID x 5/8" OD x 1/16" Thk)
18	853-0008	19	Washer, Lock - Shakeproof (External) Voltage Regulator Mounting (#8)
19	871-0007	3	Nut, Hex - Heat Sink Mounting (8-32)
20	871-0018	2	Nut, Hex - Gate Control Rectifiers Mounting (1/4-28)
21	871-0010	3	Nut, Hex - Diode Rectifiers Mounting (10-32)
22	860-0008	4	Nut, Hex - Terminal Block Mounting (8-32)
23	853-0005	19	Washer, External Shakeproof Chassis Assembly (#8)

EXCITER ROTOR



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	358-0016	3	Rectifier, Diode - Positive	11	526-0009	4	Washer, Flat (7/32" ID x 1/2" OD x 1/16" Thk)
2	358-0015	3	Rectifier, Diode - Negative	12	332-0050	2	Clamp, Loop
3	870-0053	6	Nut, Hex (#10-32)	13	508-0187	4	Spacer, Stepped
4	850-0030	6	Washer, Lock - Spring (#10)	14	508-0156	4	Washer, Flat - Fiber (19/64" ID x 1-7/8" OD x 1/8" Thk)
5	508-0093	2	Grommet, Rubber	15	850-0030	5	Washer, Lock - Spring (#10)
6	813-0100	2	Screw, Machine - Round Head (#10-32 x 1/2")	16	870-0053	4	Nut, Hex (#10-32)
7	526-0008	2	Washer, Flat (13/64" ID x 7/16" OD x 1/32" Thk)	17	363-0054	1	Heat Sink, Rectifier - Positive
8	850-0030	2	Washer, Lock - Spring (#10)	18	363-0055	1	Heat Sink, Rectifier - Negative
9	870-0053	2	Nut, Hex (#10-32)	19	201-1737	1	Rotor, Exciter
10	813-0110	4	Screw, Machine - Round Head (#10-32 x 2")				

Onan Corporation
1400 73rd Avenue Northeast
Minneapolis Minnesota 55432

612 574 5000
Telex 29 0476
TWX 910 576/2833